DOCUMENT RESUME

ED 024 876 AC 002 987

AIAOS Additions to Principles and Techniques of Instruction.
Air Univ., Maxwell AFB, Ala. Academic Instructor and Allied Officer School.
Pub Date Nov 67
Note-52p.
EDRS Price MF-$0.25 HC-$2.70
Descriptors-Bibliographies, Case Studies (Education), Interviews, *Learning Processes, Lesson Plans, *Military Training, *Teacher Education, *Teaching Methods, Writing

Designed as additional materials for study by Air Force academic instructor resident trainees, these chapters review retention, transfer of learning, and other elements and principles of learning; steps in preparing effective instructional materials, together with criteria for self-appraisal; the setting of desired learning outcomes, selection of instructional materials, and other stages in lesson planning; the use and design of teaching interviews so that persons with special experiences and qualifications can satisfy planned learning outcomes for students; and guidelines for using various types of case studies in Air Force teaching. Also included are a model of training techniques and learning objectives, a sample lesson plan, and a selected bibliography on the case study method. (ly)

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

AIAOS additions to

PRINCIPLES AND TECHNIQUES OF INSTRUCTION

The chapters contained herein are additional materials for study by Academic Instructor Course resident students. These chapters are either in addition to or in place of certain chapters in the current Air Force Manual 50–9, *Principles and Techniques of Instruction*. These chapters are to be used as follows:

Chapter 1, "The Psychology of Learning," replaces Chapter 2, AFM 50–9.
Chapter 2, "Writing," replaces Chapter 8, AFM 50–9.
Chapter 3, "Lesson Planning," replaces Chapter 15, AFM 50–9.
Chapter 4, "The Teaching Interview," contains material not found in AFM 50–9.
Chapter 5, "The Case Study in Military Teaching," replaces Chapter 18, AFM 50–9.

Students are to read these chapters as assigned.

ED024876

AC 002 987

ACADEMIC INSTRUCTOR AND ALLIED OFFICER SCHOOL

AIR UNIVERSITY
MAXWELL AIR FORCE BASE, ALABAMA

NOVEMBER 1967

This publication has been reviewed and approved by competent personnel of the preparing command in accordance with current directives on doctrine, policy, essentiality, propriety and quality.

CONTENTS

Chapter

1 THE PSYCHOLOGY OF LEARNING 1

Milestones in the Study of Learning 1
Learning: A Process of Change 5
Characteristics of the Process 5
Kinds of Learning: The Basis for Method 9
Learning Concepts and Generalizations 12
The "Laws" of Learning 14
Retention 15
Transfer of Learning 16

2 WRITING 18

Effective Writing 18
Organizing Before You Write 19
Developing Your Ideas 21
Self Appraisal 23
Clarity (Did you communicate clearly?) 23
Appropriateness (Does the writing fit its environment?) 24
Directness (Do your ideas come into focus quickly?) 25
Correctness (Have you met the standards of accepted usage?) 25
Checklist 27

3 LESSON PLANNING 28

Establishing the Lesson Objective 28
Formulating Desired Learning Outcomes 31
Researching the Topic 32
Organizing the Material 32
Selecting Instructional Methods 34
Preparing the Lesson Plan 36

4 THE TEACHING INTERVIEW 38

Background 38
Uses of the Teaching Interview 38
Planning the Teaching Interview 39
Coordination 40
The Interview Lesson 40

5 THE CASE STUDY IN MILITARY TEACHING 46

Types of Case 46
Writing Cases 47
Advantages of the Case Method 47
Limitations of the Case Method 48
Role of the Instructor 48
Responsibility of the Student 49

CHAPTER 1

The Psychology of Learning

Man learns! But then so do monkeys and horses and flatworms. If the capacity for learning is not unique to man, it must nevertheless be counted as a much more significant characteristic of man than of any other creature on earth. Even though monkeys and horses and flatworms can learn new responses and sometimes even elaborate behavioral patterns, they apparently communicate little of their learning to each other and to subsequent generations. And the most important needs of animals (food and shelter) are met by instinctive behavioral patterns that change little from generation to generation. On the other hand, human beings apparently are born almost without instincts. Beyond the *basic* functions of the various body systems and structures, people must learn virtually everything they will use to manage themselves and to function in their environment. For that reason, people have a highly specialized and extensive capacity for learning. Not only can they profit and learn from their daily encounters in the world, but they can also learn in formalized learning experiences under the guidance of other human beings—people we call teachers. As simple as that statement is, it has some significant implications:

> **With learning as important as it is to the individual, each person ought to have some understanding of his own learning processes.**
>
> **Anyone who intends to guide and direct the learning activities of others requires a fairly detailed understanding of the nature and processes of learning.**

Thus on either count there is need for attention to the subject of educational psychology.

Decisions about teaching techniques should be based upon the principles of learning. Although most beginning teachers have too many immediate problems to solve to worry much about general questions of learning and educational theory, the time ultimately arrives when the serious teacher will have mastered some of his most pressing day-to-day problems and can reflect on and wonder why some things work and others don't.

In large measure this entire text could be viewed as a study of applied educational psychology, for the subject underlies virtually everything with which the instructor is concerned. In this chapter, however, only that branch of psychology dealing directly with learning will be considered. There are many other areas of psychology which the teacher should study, but they are outside the scope of this chapter. In addition, this chapter is only introductory in nature. It does not, of course, fill the need for an instructor to understand the psychology of learning. Further study in this area will be especially meaningful after some teaching experience has been acquired.

The approach of this text is mostly in a practical vein, and so the conclusions drawn from psychology are the distilled result of the studies of many researchers. In order to provide background and context to the practical conclusions given, the student may first want to know something of the sources from which they come. Thus the treatment of psychology begins with a very brief glimpse into the endeavors of some of the more recent notables in the field. The balance of the chapter presents conclusions drawn from psychology which can benefit the teacher and enhance learning.

MILESTONES IN THE STUDY OF LEARNING

Almost three centuries ago England's great John Locke was challenged by the question, as we still are today, how do we learn? At a meeting with his friends for a discussion of this subject, Locke suggested that they should first determine how the mind acquires knowledge, what questions it is capable of dealing with, and what its limits are. Locke devoted seventeen years to a study of these problems and embodied his results in his famous *Essay Concerning Human Understanding* (1690), still regarded as one of the world's great classics.

Locke believed he had answered the main questions about the process of learning. He had found little satisfaction in his studies at Oxford and had become convinced that self-education was the best education. We learn, he said, from experience, that is, from the information received from our senses and from our reflections upon this information. Today, this makes quite good sense, although it was controversial in the seventeenth century. Today, in response to the rapid pace of the sciences and the new demands upon the capacity of men to learn, different kinds of answers to Locke's questions are being demanded. The inventory of formal knowledge turns over very rapidly nowadays; there is a restless and quickening pace of change in the physical and cultural demands of the environment; there are problems of communication and understanding between peoples living and working together; there is a pressing need for educational and training programs to keep up with all of this; in short, there is more than ever to learn—and thus more need than ever before to learn about the learning process itself.

Questions such as these call for answers:

- **If we learn from experience, what kind of experiences are most conducive to learning?**
- **Why do some individuals learn so much faster than others, even though their experiences are at least superficially similar?**
- **Why are so many individuals able to learn quickly how a gasoline engine works but unable to grasp the simplest concepts of economics?**
- **Why does some learning last for life while other learning is forgotten in a few days?**

During the past several decades an overwhelming amount of information and a disconcerting variety of approaches and answers to the quest for more knowledge about the learning process have been provided by psychologists, physiologists, anthropologists, and researchers in many other fields. Fortunately for the instructor who is studying in this area for the first time and trying to organize such a vast amount of material in his own mind, it is possible for him to identify two broad lines of approach. One line is primarily concerned with behavior as central to any understanding of the learning process. One group of psychologists—the behaviorists—in their efforts to understand the process, have concentrated on studying observable acts and have generally viewed learning as behavior modified in response to specific stimuli. In their view, the entire learning process is essentially mechanical. On the other hand, some psychologists have found the essence of learning to be cognitive, that is, to involve an act of "knowing." Through the years it has not always been clear whether the behaviorists and the cognitive psychologists have really been disagreeing with one another or simply emphasizing different aspects of learning and describing them with different words. But for whatever reason, knowledge of the learning process has progressed along two separate paths, and most of the men contributing to that progress are identified with one tradition or the other.

The Behaviorists

The first of these traditions is that of the behaviorists.

PAVLOV AND THE CONDITIONED REFLEX. Around the beginning of this century, a man whose name is one of the most famous in modern leaning theory—Ivan Pavlov, the Russian physiologist—began a series of conditioning experiments that were to have a tremendous influence on the psychology of learning. He introduced the concept of conditioning and established many of its basic principles.

In Pavlov's most famous experiment, he would ring a bell just before powdered meat was squirted into a dog's mouth. At first, the dog did not salivate until it actually got the meat. After this sequence of ringing the bell and placing meat powder in the dog's mouth had been repeated a number of times, Pavlov found that the dog salivated at the sound of the bell alone. He also found that eventually the dog would stop salivating at the sound of the bell unless the meat was offered with it periodically.

Pavlov called the response to the bell a "conditional reflex," and he came to view "conditioning" as the "principle of learning." Today this kind of conditioning is called "classical conditioning" to distinguish it from another kind. Pavlov's influence is such that most psychologists agree that a great many responses are conditioned, although only a few have taken the extreme position that *all* learning is based on conditioning.

THORNDIKE AND HIS "PROBLEM BOXES." In other places, some psychologists were also attempting to teach animals to act more purposively. For example, at about the same time that Pavlov was doing his experiments, an American named Edward Lee Thorndike—a forerunner of the behaviorist movement—was also interested in the objective study of stimuli and responses. However, Thorndike was a psychologist, and he was not concerned with the physiological processses underlying the responses, Pavlov's main concern.

Thorndike viewed learning as problem-solving. Typically, he and many others who followed him studied the ways in which dogs, cats, and rats worked their ways through mazes and out of "problem boxes." Although more than sixty years have passed since these experiments were first performed, their implications are still not entirely clear. Thorndike himself believed that his animals were learning, through trial and error, how to solve a particular problem. He viewed trial and error as a process by which learners developed mental associations, or "connections," that enable them to solve problems. "Learning," Thorndike once said, "is connecting." His so-called Law of Effect held that any connection producing a satisfying state would tend to be repeated; that is, the animal would tend to repeat whatever behavior had led it to get out of the box the previous time. What is unclear, however, is whether the animals he tested understood how their behavior was helping them to get out of the box and at their food. More sophisticated and more carefully designed experiments conducted later suggest that the animals may have simply discovered that when they bumped into the release mechanism they were soon out of the box—but that they may not have realized which movement it was that had sprung the release.

John B. Watson—the First "Behaviorist." Behaviorist psychology reached its most intense and dramatic phase in the United States during the 1920s. It was at this time that the doctrines of a strange and contradictory American, John B. Watson, were influential and controversial, both in academic circles and among the lay public. He was the first psychologist to call himself a behaviorist. He was impressed by the fact that in studying animal behavior it is possible to dispense with consciousness and simply study what the animal does. The reason for the name "behaviorism" is clear enough. Watson was interested only in behavior, not in conscious experience. Thus, he believed that the *mind* could not be studied scientifically and should, in effect, be ignored by psychologists. The only thing that could be studied scientifically, he said, was behavior. He felt that by observing behavior closely enough, psychologists could learn everything they had to about the mind. It was Watson's ultimate aim to be able to predict what the human responses would be if all the stimuli were known.

Watson's opposition to admitting anything subjective into psychology led him to reject much more than the study of consciousness. Another of his targets was the analysis of motivation in terms of instincts. At the time Watson's career began, it was common to explain almost any form of behavior as due to a particular instinct. Sociability was attributed to an instinct of gregariousness, fighting to an instinct of pugnacity, and so forth. These were assumed to be innate and to determine in considerable measure what behavior people would show. These instincts were too mentalistic for Watson. He asserted that behavior is, on the contrary, a matter of conditioned reflexes, that is, of responses learned by what is now called classical conditioning. By such reasoning sociability or aggression is not explained as due to an instinct, but as a result of learning through conditioning.

Watson's demolition of theories extended not only to instincts but to other supposedly innate mental characteristics of man. He denied that human beings are born with any particular mental abilities or traits or predispositions. Watson felt that humans are born with only three real emotions: fear of loud noises and of falling, anger at being restrained from moving, and love at being petted or stroked. All other reactions, he said, are learned. He believed that he could train any child—through conditioning—to become any type of specialist he might select—doctor, lawyer, artist, merchant-chief—regardless of his talents, abilities, vocations, and race of his ancestors. In Watson's view, there was practically no limit to what man—properly conditioned—might become.

What about the acquisition of knowledge? Can conditioning be used to explain how one learns, for example, the facts of history? Certainly said Watson, for this knowledge consists simply of saying certain words, aloud or to oneself. Acquiring knowledge, he said, is a process of learning to give the proper sequence of words in response to a question or other conditioned stimulus.

All behavior, said Watson, tends to involve the whole body. During thinking, one may pace the floor or furrow his brow. Opinions are announced with smiles or waves of the arm as well as with words. Watson felt that one could not simply say that emotions are only visceral responses or that thinking is made up only of vocal responses. These are dominant but by no means the only responses involved. Everything one thinks, says, or does, involves activity of, to varying degrees, the entire body. This is probably the most fundamental credo of behaviorism.

It is also not surprising that Watson's "mechanical" view of human beings led him into one controversy after another. In his eagerness to build an objective psychology, he was somewhat disdainful with the matter of logical thoroughness. Perhaps if he had worked on his theory longer he would have extended his system to deal with some of these problems. (After the 1920s he stopped publishing and went into the advertising field.) By the time Watson died in 1958, much more sophisticated behaviorist theories on learning had been developed. In any case, Watson is now admired mainly for his philosophical trailblazing rather than for his detailed system building. It has remained for others to try to build, within the behaviorist framework, a more complete theory of learning.

B. F. SKINNER—"SHAPING" BEHAVIOR BY REINFORCEMENT. The behaviorist, B. F. Skinner, of Harvard, is probably one of the best-known psychologists now active in the United States. Like many famous scholars, he appears to have achieved fame for accomplishments that he considers secondary. His fame with the general public rests principally upon his identification with teaching machines, as though he were the inventor of a new gadget to promote "instant learning"! Actually he views the theory underlying these machines—that is, his analysis of behavior—as a more important contribution to American education. History may well prove his judgment correct.

Like most modern behaviorists, Skinner lays great stress upon the concept of "reinforcement"—that is, strengthening a desired response through reward. This part of the theory is not original with Skinner, but he is the innovator of the idea of breaking behavior down into many small components and reinforcing each of them systematically. In this way even complex behavior, including learning behavior, could be "shaped" by a teacher. Learning of this type is referred to as *instrumental conditioning*. Perhaps the most well-known apparatus used for instrumental conditioning of animals is the "Skinner Box," a small box that contains a little lever, a food cup, and perhaps a light. In the typical instrumental learning experiment, the animal placed in this box must make the desired response—for example, lever pressing—before it is rewarded. Therefore, it is the animal's actions rather than the experimenter's scheduling that determines the frequency and rate of rewards. This type of learning is also called *response substitution*. The experimenter usually decides beforehand which of the animal's many possible responses will be reinforced. As the selected response is reinforced, its probability of occurring becomes greater and greater. Skinner has demonstrated these principles dramatically in experiments with many different animals. He has, for example, taught pigeons to discriminate among playing cards, to peck out tunes on a toy piano, and even to play a kind of table tennis.

Skinner's ultimate interest, of course, has been human learning, and the possibility of shaping human behavior in ways that constitute learning. In typically behaviorist tradition, Skinner insists on defining learning only in relation to behavior: "We can define terms like 'information,' 'knowledge,' and 'verbal ability' by reference to the behavior from which we infer their presence. *We may then teach the behavior directly.*" Thus, according to Skinner, "instead of 'transmitting information to the student,' we may simply set up the behavior which is taken as a sign that he possesses information . . . ."

The Cognitivists

Behaviorists before and after Watson investigated the learning process by studying stimuli and responses "atomistically"—that is, by breaking down the process into its basic elements so that cause and effect might be discerned more clearly. This kind of approach—of concern with detailed analysis in learning—was challenged by the Gestalt psychological school when it became influential in the 1920s.

KOHLER'S APES AND GESTALT PSYCHOLOGY. The Gestalt psychologists were working in the cognitive or "knowing" tradition. They believed that normal learning involved a process of organization that had to be studied as a whole—hence Gestalt, the German word meaning "whole." In their view, learning could not be broken down into connections as Thorndike believed or conditioned reflexes in the tradition of Pavlov.

One of the most influential of the Gestalt psychologists was Wolfgang Kohler. Kohler showed that apes normally solve problems in ways that suggest thought processes at work. Among other things, his experiments settled, quite conclusively, the age-old argument as to whether man was the only animal capable of reasoning. He found, for example, that an ape attempting to reach food placed outside its cage and beyond its reach would pick up a stick and manipulate the food into a more accessible position. Sometimes, an ape might devise his own tools such as breaking off a branch in order to reach the food. It is significant that the apes' approach to these problems was quite different from that of Thorndike's animals. Frequently, Kohler reported, an ape would sit looking at the problem for some time, and then seem to arrive at the solution quite suddenly. Kohler stated that this was "insightful behavior." Psychologists have sought for many years to determine what accounts for the sudden solution that is the hallmark of insight learning. Some have thought it may be a sudden perceptual reorganization; others think it may depend upon previous learning. Today, the evidence favors the view that such sudden solutions usually occur when there has been considerable opportunity—and capacity—for previous learning. How may insight learning depend on what has been learned previously? The period before the sudden solution might simply be the time necessary to remember and reconstruct what was previously learned. According to this point of view, insight learning is nothing more than the carry-over, or *transfer,* of previously learned habits, with some rearrangement, to a new situation.

The influence of the cognitive theorists has until only recently been overshadowed by psychologists working in the behaviorist tradition. As an example of the contemporary contributions of the cognitivists, attention is now given to the studies of Bruner, one of Skinner's colleagues at Harvard University.

Bruner and the Nature of Perception. The work of Jerome Bruner, co-director of the Center for Cognitive Studies at Harvard, reflects his intense interest in the nature of perception. He divides the phenomenon of perception into three elements. In his opinion, perception begins with a "set," or hypothesis about what is to come—that is, a person "gets ready" to respond in a certain way to something in his environment. This hypothesis is based on the individual's past experience. The second stage in perception is the input of information from the environment. The third state is the act of "checking," or confirmation. "If confirmation does not occur, the hypothesis shifts . . . ." Thus perception becomes an active process of using information to suggest and test hypotheses. Clearly this involves learning, but to what extent is not completely understood. It does seem reasonable and necessary that the human visual system has developed the ability to use non-visual information, for example, and to go beyond the immediate evidence of the senses. Thus by building and testing hypotheses, action is directed not only to what is sensed but to what is likely to happen, and it is this ability to predict that really matters. The human brain is in a large part a probability computer—a betting machine—and behavior is based on the best bet in a given situation.

In teaching, especially younger people, Bruner believes it is important to get these students to check their hypotheses carefully. Young people, in particular, have a natural tendency to jump to conclusions, but this is not helpful in doing research or in problem solving. A more mature person trained to test hypotheses is characterized by his willingness to suspend judgment, to keep the hypotheses open, and to keep his state of readiness generalized. Bruner considers the most important ingredient in learning to be "a sense of excitement about discovery—discovery of regularities, of previous unrecognized relations and similarities between ideas, with a resulting sense of self-confidence in one's abilities." In order to enable students to make this discovery, the material must be structured or presented in a way that is meaningful to them. Bruner has gone so far to suggest, in an often-quoted statement, "Any subject can be taught effectively in some intellectually honest way to any child in any state of development." It is a challenging statement directed to all teachers.

LEARNING: A PROCESS OF CHANGE

From the foregoing it is evident that learning is a process that is only partly understood. Learning cannot be *directly* observed; therefore, our understanding of it comes from inferences drawn from observing the behavior of man and other organisms. As a result of interacting with its environment, an organism adapts and modifies its behavior. When such behavioral changes are relatively permanent, we speak of learning as having occurred. Thus an individual's learning may involve changes in his ways of perceiving and thinking; his physical behavior—his motor skills; and his emotional reactions or attitudes. Learning refers to any of these changes as they occur as a result of experience. It remains to be seen what actually happens to an individual to account for the changes. Whether as a matter of bodily chemistry or structural modification within the central nervous system, or whatever, has not been established. So when learning is defined as a change in behavior as a result of experience, the instructor should realize that only the observable *result* of learning is being described. Even though learning itself cannot be literally described, the characteristic conditions under which it occurs *can* be identified. The instructor should understand these and turn them to good use.

CHARACTERISTICS OF THE PROCESS

The learning process has several characteristics which can be isolated and discussed.

Learning Is Purposeful.

From experience and deliberation, most people have fairly definite ideas about what they want to do and achieve. Their goals sometimes are short term, a matter of days or weeks. On the other hand, they may be carefully planned goals for a career or a lifetime. The purposes of people may be shallow and of no great importance, or they may concern the basic issues in the individual's life. In any case, the student brings his purposes and goals into the classroom. Some of these purposes and goals may be unique, while others may be shared with his classmates. A student learns from any activity that tends to further his own purposes. His individual needs and notions may determine what he learns just as much as the planned lesson. In the act of learning, the learner's purpose is of paramount significance. The effective instructor seeks ways to relate new learning to the student's goals.

Each student sees the classroom situation from a different viewpoint, because he is a unique individual whose past experiences affect his readiness to learn and his understanding of the requirements involved. If there is an assignment for a practice speech, for example, one individual may respond with a sincere effort to deliver a well organized, meaningful presentation. Another may make minimum preparation and "just talk" for his allotted time, because it is only for practice and he feels that it doesn't count. Still another may be afraid of "freezing up," and deliver a memorized speech copied directly from a textbook. The responses differ because each person acts in accordance with the requirements *he sees* in the situation. Each person spends a high percentage of his energy fulfilling the purposes and goals he recognizes as being important.

Because students have complex purposes for learning, instructors generally have more difficulty with student motivation than with other areas of teaching. Instructors need a clearer understanding of the factors that account for the energy and direction of their students' learning efforts because those factors may well be crucial to the success of the learning experience. The numerous theories of motivation offer many points of view from which the student's actions may be understood. The sincere instructor should make a detailed study of motivation and its application to his own students in his classroom. He should understand how a person's concept of self strongly influences what he can and will try to do. He also should study the psychological needs—the personal-social needs—of individuals. He may find his students' actions conditioned by a need for security, for new experience, for recognition, for self-esteem, for conformity, or for helping others. The instructor's responsibility is, first, to recognize the factors that impel the student and then to relate those factors to his teaching.

To be successful, the student must have a need to know, to understand, to believe, to act, or to acquire a skill. The wise teacher realizes that these needs are not separate and distinct from the personal-social needs of the student. In fact, the most effective motivation trades heavily on this awareness. The teacher must make students want to learn, and in some cases, must remove obstacles that students have placed in the paths of their own learning. The student must have a reason for learning, and if he cannot find it for himself, the teacher must find it for him.

A need to learn presupposes goals or objectives. If the motivation is of the right kind, the student will know what these goals are and how he can reach them. In the learning situation, the teacher usually establishes the objective for students, making sure that it is clear and specific. Without an objective, neither the student nor the teacher can measure progress or evaluate achievements.

Illustrations of weak and strong motivation are all around us. Consider, for example, the student who attends a required course in communications-electronics without any prospect of using what he studies. Since his interest in the course is academic and communications-electronics has nothing to do with his job or his future, it is difficult for him to learn much from the course. If, on the other hand, a student knows that at the end of this same course he will be assigned to a job requiring the knowledge of communications-electronics, he will have a goal that goes beyond the mere completion of the course. He can partially satisfy his need for recognition, for security, for self-esteem, and for a new experience by mastering the course material. In this latter instance, even though the need and the desire to know are built in, the student needs and wants to know the objective of the course and to believe that he can reach it.

In meeting his responsibility to motivate learning, the teacher can capitalize on whatever built-in motivations he finds in his students. The big challenge is to shape personal-social motivations to make them serve the learning situation. The teacher must first establish learning objectives and then activate forces that will cause the student to work toward those objectives. This is motivation.

Learning Is Multi-Faced.

Later in this chapter, there will be a discussion concerning various kinds of learning—learning skills, learning concepts, and learning generalizations. The separation is an expedient that may seem to suggest that learning is compartmentalized, that only the mind or the muscles, or the feelings are being taught at any one time. Actually, the student's full set of learning equipment is always involved.

A student studying radar maintenance may be learning to perform a specific operation, such as changing the radar antennae on a certain aircraft. But in the process, he is learning new concepts and generalizations, perhaps learning new applications of electronic principles. He increases his interest in "black boxes." He learns something about handling electronic equipment in general. So, his experience results in changes in his ways of perceiving, feeling, thinking, *and* doing, although his instructor may have been primarily concerned with his ability to change radar antennae.

If a teacher sees his objective as being only to train the student's memory or muscles, he underestimates the potential of the teaching situation. The student may have learned much that the teacher had not intended: the student did not leave his thinking mind or his feelings at home, just because they were not included in the teacher's plan.

Psychologists sometimes classify learning by types: verbal, conceptual, perceptual, motor, problem solving, and emotional. However useful these divisions may be, they are artificial. For example, a class learning to apply the scientific method of problem solving may learn the method by trying to solve real problems. But in doing so, it also engages in "verbal learning" and sensory perception at the same time. Each student approaches the task with preconceived ideas and feelings, and for many students these ideas will change as a result of the experience. The learning process, therefore, may include verbal elements, conceptual elements, perceptual elements, emotional elements, and elements of problem solving, all taking place at once.

Learning is multi-faced in still another sense. While learning the subject at hand, students may be learning a variety of other things as well.

They may be learning cooperation and group dynamics. They may be developing attitudes about the Air Force—good or bad, depending on what they experience. Under a harsh authoritarian instructor, they may learn how to cheat or be evasive. Under a skillful instructor, they may learn how to be self-reliant. The list is seemingly endless. This learning is sometimes called "incidental," but it may have a great impact on the total development of the student.

Learning Is Partly a Common Process and Partly an Individual Process.

Students are very different from one another, but they are also very much alike in important ways. Students have many general characteristics in common, but they have individual differences within these general characteristics. For example, most all people have intelligence, but they have it in varying amounts (and perhaps varying kinds). Similarly, most students have personal-social needs, but these needs are expressed and met in different ways. Most importantly, most students learn the same way, but there are differences from one individual to another, simply because each student is unique.

The instructor does well, then, to study learning as a generally applicable process, involving principles which can be valid and which can also lead to successful teaching and learning if they are wisely applied. However, the instructor also realizes that he must be wise in applying these principles, understanding and accounting for the ways in which his students are unique individuals.

A new instructor is likely to be discouraged when he discovers that a well-planned lesson does not teach all of his students with equal effectiveness. Usually, however, he soon sees that this is a natural and predictable state of affairs, because students seldom learn at the same rate. Differences in rates of learning are based on differences in native intelligence, background, experience, interests, desire to learn, and countless other psychological, emotional, and physical factors. That students are different is a hard fact of life that teachers must cope with and recognize as the factor which largely dictates how much can be taught at what rate and when.

Since students do not learn at the same rate, it follows that the levels of student understanding will not be the same at any given moment. In other words, all students will not learn the same thing to identical degrees. The teacher must detect the differences; that is, he must determine individual levels of understanding, how much each student learns. Otherwise, he cannot know how well he has taught, whether or not his job is finished, and what, if anything, he should do next.

The teacher has several gauges with which he can measure a student's understanding or mastery of a lesson. Student discussions afterwards are helpful and generally reliable. A study of students' test and achievement scores sometimes provides objective assessments. Personal conferences, contacts in the classroom, written assignments, and informal talks can also indicate a student's status and progress.

Once he has determined the differences in rates of learning, the good teacher attempts to compensate for them. He tries to equalize the different levels of understanding. Ideally, he raises the level of some without retarding the progress of others. This is one of the greatest challenges of teaching, and a teacher can meet it in a number of ways.

The teacher can plan semi-independent classroom activities in which the student works alone or as part of a small group. The teacher may be available to give help, but only when requested or needed. The student works on his own, aware that help is there if he needs to call for it. This type of instruction requires a student to be independent within the limits of his capabilities, but it does not put him in a sink-or-swim position.

The teacher can provide for supervised study, which requires his presence and guidance. Supervised study is tutorial in the sense that the teacher gives personal and individual instruction where needed. This often reaches students who are hesitant to speak out in the presence of their classmates, but feel free to talk with their teacher. A student sometimes has special problems that do not concern the class as a whole, and certain students will not air their problems before a group. Such problems may well prove an effective "barrier" to learning. Supervised study gives these students a chance to deal with their problems in private. By using this device, a teacher frequently discovers that what a student considers a special or unusual lack of understanding is not special or unusual at all but common to the group, although it has never been brought out into the open and discussed.

The teacher can compensate for individual differences through flexible assignments in which the workload is adjusted to the capabilities of individual students. When circumstances permit it, this plan can create an ideal learning situation in which each student progresses at his own pace. Assigning the same work to every student has it pitfalls: It can push the poor student beyond his capability and, at the same time, fail to offer the capable student a challenge. Through flexible assignments tailored to individual capabilities, the teacher can capitalize on the specialized interests and aptitudes of all students.

The teacher who is not aware that students learn at different rates, that individual lessons have different effects on individual students, that individual reasons for learning are different, will find himself in a quandary whenever he fails to meet the objectives of the lesson. In every normal classroom he will find the daydreamers and the idealists who respond best to ideas and abstractions. He will be confronted with the student who likes experimentation and demonstration for what it proves on the spot rather than for its contribution to a universal truth. Some students will want to *do* more than they want to *know*. Some will be in a hurry, and others will refuse to be rushed. Some will be practical and others, impractical. Some will want to recite, while others will be content to listen. Some will like to write, and others will find writing a drudgery. The differences that might be listed are endless. Yet the teacher must often teach the same lesson to a group of students with these countless differences, attempting to achieve the same objective for all.

Learning Is a Building Process.

In *Defining Educational Objectives,* edited by C. M. Lindvall, Robert M. Gagne says, ". . . learning any one capability usually depends upon the previous learning of some other, simpler one. In fact, this may be one of the most important generalizations one can make about human learning." The point is that in a very real sense, learning best begins at the most basic, most simple level and proceeds on to increasingly complex forms. In most instances it may well *have* to do so. Gagne describes a hierarchy of learned capabilities, each one a level on which the next more complex or advanced level partially depends. The hierarchy begins with simple response learning and proceeds to response discrimination, sequential responses, and learned associations. These learned capabilities are vital to the higher, more complex forms but are seldom identified as learning objectives in themselves. The higher capabilities are the learning of concepts and principles. Even beyond these, according to Gagne, are the application and strategy of application of principles in problem solving.

From a different viewpoint, Asahel D. Woodruff treats general and specific or concrete concepts. He explains that a student is generally best able to learn a general concept when he has previously learned all of the supporting specific concepts which it involves. In fact, these specific concepts may themselves depend on even more specific, limited concepts.

There is a natural corollary to this principle in the learning of motor skills. There *are* complex skills, and they are best learned in a step-by-step sequence. The individual component skills should be learned and practiced. Then they can be assembled into an integrated sequence of operation.

Learning Is a Process of Internalizing Experience.

The instructor cannot learn for the student, nor can he pour predigested learning into the student's head. The student can learn well only from that which he experiences for himself.

"Learning" and "knowledge" cannot exist apart from a person. It has been customary to say that a teacher passes his knowledge on to the student. This would imply that knowledge was a "thing" that could be possessed and handled and even given to another. Such, however, is not the case. The instructor's knowledge of a thing is different from that which his students may gain, or that of anyone else. A person's knowledge is a result of his own experiences and the way he perceives them and reacts to them, and no two people have just the same experiences. Even when observing the same event, two people react differently; they learn different things from it, according to the manner in which the situation affects their individual needs. Previous experience conditions a person to respond in certain ways, to attend to some things and to ignore others.

The emphasis on "learning by experience" may seem to imply that there are other ways to learn. This is erroneous. All learning is by experience, but it takes place in different forms and in varying degrees of richness and depth. For instance, some experiences involve the whole person; others, only his ears and his memory. Therefore, the instructor is never faced with the question of whether he should provide "experience," or perhaps something else. Rather, he is faced with the problem of providing experiences that are more meaningful, more varied, and more appropriate. For example, by repeated drill a student can learn to say a list of words, or by rote he can learn to recite the principles of leadership. But he can make them part of his life only if he understands them well enough to apply them correctly in real situations, which he can do if his learning experience has been extensive and meaningful.

Learning cannot rise above its source. Superficial, narrow experience will lead to superficial, narrow learning. If an experience challenges the learner, requires involvement with feelings, thoughts, memory of past experiences, and physical activity, it is more effective than an experience in which all the learner has to do is commit something to memory.

Learning Is an Active Process.

Not only does learning come only through experience, but the student must be actively involved in that experience. This frequently heard statement has implications which may not be fully recognized. It is generally understood that a student does not necessarily learn just because he is present in a room when some subject is being "taught" by an instructor. Learning is obviously more than simply a matter of exposure of a student to an idea or a skill. Likewise it is not safe to assume that a student can apply what he knows just because he can correctly quote a paragraph from a textbook. But aside from these ideas, there is an even more basic consideration that is sometimes neglected. It *is* important that the student be actively involved in the learning situation. But not just *any* kind of activity will do. It is *critical* that the student be engaged in the appropriate type of activity.

It seems clear enough that the learning of a physical skill requires actual experience in performing that skill. A student learns to fly an airplane only if his experiences include flying one. What needs to be better understood, however, is that mental habits are also learned through practice. Even attitudes are developed or modified only as an individual reacts emotionally to the object of the attitude. Therefore it is of fundamental importance that an instructor accurately and precisely identify *what* is to be learned so that he may reasonably choose *what kind* of activity the student will need to engage in. This activity can take many forms: observing, listening, thinking, recalling, reasoning, generalizing, imagining, writing, discussing, answering, questioning, disagreeing, feeling, touching, moving, doing, speaking, etc. All of these can help the student learn.

KINDS OF LEARNING: THE BASIS FOR METHOD

The instructor must select an instructional method. What is the best approach? Which technique will best achieve the purposes at hand? The purpose for most Air Force instruction is usually the learning of a skill, a concept, or a generalization. In order to select the best method, the instructor must bear this purpose in mind. He must also know what the students are to learn and how they will learn it.

Learning Skills.

The process of learning a skill appears to be much the same, whether it is a motor (physical) or a mental skill. Most research on skill development has been in the area of motor skills, however, and this section deals with that type. Before reading further and in order to provide a real illustration of motor learning, please follow the directions below:

> **Write the word "learning" 15 times with your left hand (or with your right hand, if you are left handed). Try to improve the speed and quality of your writing.**

In the learning task just completed, several principles of motor learning were involved and are discussed in subsequent paragraphs.

Learning Physical Skills Involves More Than Muscles.

The above exercise contains a practical example of the multi-faced character of learning. It should have become obvious that, while a muscular sequence was being learned, other things were happening as well. The perception changed as the sequence became easier. Concepts of how to perform the skill were developed and attitudes were changed.

Desire to Learn Sparks the Process.

Thinking back over his experiences in learning to perform certain skills, the student might be surprised at how much more readily he learned those skills that appealed to his own needs. Shorter initial learning time and more rapid progress in improving the skill normally occurred. Conversely, where the desire to learn or improve was missing, little progress was made. A person may read dozens of books a year, but his reading rate will not increase unless he deliberately sets out to increase it. In the writing exercise it is unlikely that any improvement occurred unless there was a clear intention to improve. To improve, one must not only recognize his mistakes, but he must also make an effort to correct them; the person who lacks the desire to improve is not likely to make the effort. Consequently, he continues to practice his errors. The skillful instructor relates the lesson objective to the student's intentions and needs. In doing so, he builds on the student's natural enthusiasm.

The Student Needs Patterns to Follow.

Logically, the point has been emphasized that the best way to prepare the student to perform a task is to provide him with a clear, step-by-step example. Indeed, the first things children learn to do are learned by copying the actions of older people in the home. Having a model to follow permits the student to get a clear picture of each step in the sequence—what it is, how to do it. Often the instructor himself provides a demonstration, emphasizing the steps and the techniques. Sometimes an outside expert may be used, either in person or in a movie. In any case, the student needs to get a clear impression of what he is to do.

The Student Must Perform the Skill in Order to Learn It.

Since you have now had the experience of writing a word with the wrong hand, it might be well to consider how difficult it would be to tell someone else how to do it. Indeed, even demonstrating how to do it would not result in his learning the skill. Obviously, practice is necessary. The learner needs to refine the coordination between his muscles and his visual and tactile senses. Sometimes that requires extensive practice.

Another benefit of practice should be recognized. As the learner gains proficiency in a skill, verbal instructions begin to mean more to him. Whereas a long, detailed explanation might be confusing before he begins performing, specific comments can be much more meaningful and useful after he has begun to master the skill.

Knowledge of Results Is Essential.

In learning some simple skills, the student can discover his own errors quite easily. In learning others, mistakes are not always apparent, or the learner may know that something is wrong but not how to correct it. In any case, the instructor performs a helpful and often critical function when he makes certain that the student knows how he is doing. It is perhaps as important for the student to know when he is right as when he is wrong. He should be told as soon after the performance as possible, for he should not be allowed to practice mistakes. It is more difficult to unlearn a mistake and then learn correctly, than it is to learn correctly in the first place.

One way to apprise the student of his progress is to repeat the demonstration or example and to show him the standard against which he can compare his performance.

Progress Follows a Predictable Pattern.

The experience of learning to write a word with the wrong hand probably confirmed what has been consistently demonstrated in laboratory experiments on skill learning. The first trials were slow, and coordination was lacking. Mistakes may have been frequent, but each trial provided clues for improvement in subsequent trials. The learner probably modified different aspects of the skill: how to hold the pencil, how to execute finger and hand movements, etc.

Most graphs of the progress of skill learning usually follow the same pattern. (See Fig. 1) There is rapid improvement in the early trials. But the curve levels off and may stay level for significant periods of effort. Further improvement may seem unlikely. Such a development is a learning plateau and may signify any of a number of conditions. The learner may have reached the limits of his capability; he may be consolidating his level of skill; his interest may have waned; or he may need a more efficient method for increasing his progress. Keep in mind that the apparent lack of increasing proficiency does not necessarily mean that learning has ceased. The point is that, in learning motor skills, a leveling off process is normal and should be expected after an initial period of rapid improvement. The instructor should prepare the student for this situation to ward off discouragement. If the student knows this may occur his frustration may be lessened.

Duration and Organization of the Lesson.

In planning for student performance, a primary consideration should be the length of time to be devoted to practice. A beginning student reaches a point where additional practice is not only unproductive but may even be harmful. When he reaches this point, his errors increase and his motivation may go downhill. But as he gains experience he can profit from longer periods of practice.

Another consideration is the problem of whether to divide the practice period (and perhaps even the instruction) into segments, or whether to plan on one continuous, integrated sequence. The answer depends on the nature of the skill. But there is an amazingly wide variety of situations where short periods of practice interspersed with periods of rest permit more efficient learning than does continuous practice. Some skills are composed of closely related steps, each dependent on the preceding one; for example, learning to parachute out of an aircraft. Other skills are composed of related sub-groups of skills; for example, learning to fly an airplane.

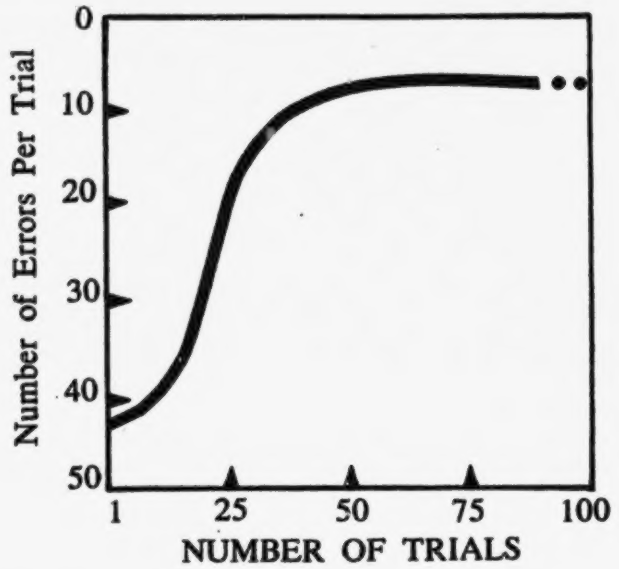

Figure 1. Typical learning curve for motor skills.

Grading vs. Critiquing.

If a teacher were to evaluate the fifteenth writing of the word "learning" he could give only limited help towards further improvement. He could judge whether the written word was legible and evaluate it against some criteria or standard. He could even assign it a grade of some sort. But what the beginning learner really needs is to have someone *watch him perform,* criticize him constructively, help him eliminate his errors, and explain what he is doing correctly.

In the initial stages, practical suggestions are more valuable than a grade. This is not to suggest that there is no reason to evaluate initial practice. To the contrary, continuous evaluation of students is a characteristic of good instructional technique. It is only through close observation of students, and analysis of their individual strengths and weaknesses, that contructive criticism can be formed. The constructive criticism that results from careful evaluation provides a useful basis for deciding how to increase teaching effectiveness and how to best help students improve their performance.

Application of the Skill.

The final and critical problem is one of use. Can the student use what he has learned? It is not uncommon to find that students have devoted weeks and months in school, learning new abilities, and that they then fail to apply some part of these abilities on the job. To solve the problem, two conditions must be present: (1) The student must learn the skill so well that it has become easy, even habitual for him to perform it. (2) He must recognize the types of situations where it is appropriate to use the skill. This second condition involves the question of transfer of learning, which is a separate subject at the end of this chapter.

LEARNING CONCEPTS AND GENERALIZATIONS

Teaching for intellectual learning offers a substantial challenge to even the expert, because the operation of this type of learning process can be only inferred, not observed. A vast amount of the literature on experimental psychology deals with the learning process, and a major portion of this is concerned with the manner in which people learn concepts and generalizations. These are the ideas that are to be known, understood, or even applied. It may well be, as some researchers suggest, that the most significant determiners of any individual's behavior are the concepts and generalizations he has formed concerning himself and the world around him. Briefly, a concept is a mental picture of a group of things that have some common characteristics. A generalization is a person's idea of the relationships between two or more concepts. For example, the definition of learning in the preceding section involves a concept of learning. The characteristics of learning, on the other hand, are generalizations.

A concept is an abstract idea about a category or class of particular things. It necessarily involves consideration of the characteristics of those things that identify them as belonging to that special class. Concepts are formed by generalizing one's experiences with a particular thing. Any "thing" that appears to have all of the identifying characteristics belongs to that class and adds to a fuller meaning of the concept. On the other hand, a new "thing" that is identified as belonging to that class may have a previously unknown characteristic which may also add to a fuller meaning of the concept. Concepts may represent concrete objects (airplane, book, dog) or abstract ideas (honesty, leadership).

A generalization is a statement of relationship, usually of wide application. Ordinarily, it is a statement about the relationship of two or more concepts. For example, a person may have formed the concepts of *jet aircraft* and of *loudness*. Through experience he may form the generalization that "jet aircraft are loud." Not all generalizations are verbalized. A person may have developed the generalization that a certain type of situation brings him satisfaction. He may seek out that situation but not know specifically why. It should also be noted that generalizations are not always true. People sometimes have erroneous ideas about the world in which they live. Natural laws are stated as generalizations. So are the rules or principles of any body of knowledge. The teaching of generalizations has been, and will continue to be, a major point of emphasis for educational systems in and out of the Air Force. But there is a clear and pressing need to do it more effectively, and more efficiently.

How Concepts are Formed

Concept formation is a process of classification—of the naming of categories. Through experience, the individual builds up his notion of the characteristics or dimensions of various categories of things. Consider how a child may form his concept of DOG. First, he learns that the family collie is a DOG. He discovers that this DOG has four legs, long fur, long snout, short upright ears, and a long bushy tail. It barks and is friendly. It is also quite large (bigger than he is, but smaller than his father). Secure in his notion of DOG, the child then confronts a bull dog and finds he must adjust his picture of the class. Dogs can be of different sizes. They may have short hair and almost no tail. They may have short, ugly snouts. They still bark, are friendly, and have upright ears. Then one day the child learns from a friend whom he trusts, that there is such a dog as a Mexican hairless. An almost radical change occurs in the concept of DOG, but the resulting picture is a more valid view of the whole class.

Eventually, of course, the child gets a wide range of experiences and his concept of DOG is complete. He reaches the point where he can see new animals and correctly classify them as dogs or not-dogs. His confidence may be shaken when he realizes that a wolf fits his category almost completely, but at least he knows a dog when he sees one.

From the foregoing, it is evident that a great deal of concept formation must occur without the specific aid of teachers. In fact, the point is made frequently that concept formation does not depend on the depth of experience so much as on the width and amount of it. Extensive experience with a wide variety of encounters builds up valid concepts. What then is the role of the instructor?

First, the instructor can identify and organize those experiences which will provide the basis for forming the concepts the student needs. That, of course, presumes that the instructor has identified the desired concepts. The instructor is in a position to help the student organize his knowledge and identify the critical features of the concept category. As the student develops greater resources of experience to draw on, he reaches the point where he can profit from vicarious experience: by listening to well taught lessons, and by comparing experiences with other students.

The key word is experience. Valid, meaningful concept formation must be based on a hard core of firsthand experiences.

That statement leads to the second function of the teacher, a negative one. He should actively guard against the student's acceptance of "ready-made" concepts, such as the description of a concept from another person. The student has no basis of experience for such a concept; he merely memorizes the words and repeats them on occasion. In this case, his learning would be only verbal. His handicap would become evident if he were confronted with an unfamiliar variation of the concept. Had the concept of DOG been gained on only the verbal level a person might react to a new animal thus: "I know that collies are dogs, and pointers are dogs and boxers are dogs, but what is a St. Bernard? He looks like a horse to me!" There is the temptation to believe that the student who can recite the key ideas understands the concepts involved. Unfortunately, this is not necessarily true, a fact that most teachers surely realize. Yet, there are instructors who still try to teach mostly with words and with too few meaningful learning experiences.

How Generalizations are Developed.

Generalizations, like concepts, are formed out of the experiences of the learner. In fact, the process of concept formation may proceed at the same time that the learner is developing generalizations about the concepts. It is easily possible to have a fairly well established generalization in mind, and still be a bit hazy about some of the concepts involved. For example, a person may have formed the concept that "The republican system of government is better than all other systems in the world." But he may not have too clear an understanding of what the concept, "other systems," might mean. And, for that matter, he may have only a general notion of what the concept, "republican system," really means. In this case, it can be seen that the generalization is correct, but the basis for it, in that person's mind, may not be strong. Such a situation is probably not desirable, and the danger is that it can happen! For example, before reading further and to illustrate this point, please memorize the following generalization:

> Glunders should be delped ordly.

Now, to test your grasp of the principle, please answer the following questions:

> What should be done to "Glunders"?
> How should it be done?

If you memorized the principle well and studied the questions carefully, you probably answered that "Glunders should be delped," and that "they should be delped ordly." Of course, you still do not have the slightest notion of *what* Glunders are, or *how* they are "delped ordly." The concepts involved are devoid of meaning; therefore, the generalization is pointless. It has no applicability to your life or problems. Instructors need to be constantly aware of this criterion of meaningfulness.

Concept formation depends to a greater extent on the amount and variety of experiences than on their depth and significance. The development of generalizations requires not only extensive and varied experiences, but meaningful and significant experiences as well. For this reason, the role of the instructor becomes one of increased importance in this area. Inaccurate generalizations result from too little information and experience or from prejudices or biases which influence the interpretation of what has been experienced. A strong desire to believe a particular point of view may even lead to its acceptance. All of these conditions present challenges to the instructor.

An Approach to Meaning in Conceptual Learning.

Three basic steps can help provide an approach to meaning in conceptual learning.

1. Reduce the number of concepts and generalizations taught so that the student can thoroughly master what he does learn. There is little point in requiring the student to memorize 100 principles to pass the final test, if he is likely to forget 95 of them as soon as he is graduated. It would be better to teach only 10 principles if the student can learn them so well he remembers them always and uses them correctly. This illustration is an over-simplification. In practice, the decision would seldom be that easy, but the point is valid.

2. Teach concepts and generalizations "from the ground up." Provide practical and varied learning experiences so that the student can build a solid basis for his concepts. Provide wide enough and significant enough experiences for the student to develop clear and useful generalizations, not just pointless verbalisms.

3. Be constantly aware of the individual differences among the students. Their range of experience and of learning readiness presents a challenge to the instructor in planning for their individual needs. The good instructor always remembers that his lesson objective is "for *each* student to learn."

THE "LAWS" OF LEARNING

One of the pioneers in educational psychology was Professor Edward L. Thorndike, Teachers College, Columbia University, New York. Early in this century Professor Thorndike postulated several "laws" of learning. These were rules or principles that seemed generally applicable to the learning process. In the years since, other psychologists have found that learning is a more complex process than some of these "laws" suggest. This does not imply that Professor Thorndike's ideas have been invalidated. While his laws seem to have significant exceptions, they still provide an insight into the learning process and are included in this chapter for that reason.

The "laws" that follow are not necessarily as Professor Thorndike stated them. During the years they have been restated and supplemented, but in essence, they may be attributed to him. The first three are the basic laws, as originally identified: the law of readiness; the law of exercise; and the most famous and still generally accepted, the law of effect. The following three were added later as a result of experimental studies: the law of primacy, the law of intensity, and the law of recency.

The Law of Readiness.

A person learns best when he is ready to learn, and he will not learn much if he sees no reason for learning. Getting a student ready to learn is usually the teacher's responsibility. If a student has a strong purpose, a clear objective, a well-fixed reason for learning something, he will make more progress than the student who lacks motivation. Readiness implies a degree of single-mindedness and eagerness. When a student is ready to learn, he meets his teacher at least halfway, and this simplifies the teacher's job.

Under certain circumstances, the teacher can do little, if anything, to inspire in a student a readiness to learn. If outside responsibilities, interests, or worries weigh too heavily on a student's mind; if his schedule is overcrowded; if his personal problems seem insoluble; a student may have little interest in learning. Health, finances, or family affairs can overshadow a student's desire to learn.

The Law of Exercise.

This law states that those things most often repeated are best remembered. It is the basis of practice and drill. The human memory is not infallible. The mind can rarely retain, evaluate, and apply new concepts or practices after a single exposure. A student does not learn touch typing at one sitting. He learns by applying what he has been told, and every time he practices, his learning continues. The teacher must provide opportunities for students to practice or repeat; he must see that this process is directed toward a goal. Repetition can be of many types, including recall, review, restatement, manual drill, and physical application.

The Law of Effect.

This law is based on the emotional reaction of the learner. It states that learning is strengthened when accompanied by a pleasant or satisfying feeling, and that learning is weakened when associated with an unpleasant feeling. An experience that produces feelings of defeat, frustration, anger, confusion, or futility in the student is unpleasant for him. If an instructor pilot attempts to teach aerobatic maneuvers to an aviation cadet on his first flight, the student is likely to feel inferior and to be dissatisfied. As a demonstration that shows the student his goal, the aerobatics might motivate the student. But as something to be learned immediately, the aerobatics would be frustrating. In terms of the learning objective, this experience would be unpleasant.

Teachers should be cautious about using negative motivation in the classroom. Impressing students with the seeming impossibility of a problem can make the teaching task difficult. Usually it is better to show students that a problem is not impossible at all, but is within their capability to understand and solve. Whatever the learning situation, it should contain elements that affect the student positively and give him a feeling of satisfaction. Every learning experience does not have to be entirely successful, nor does the student have to master each lesson completely. But a student's chance of success will be increased if the learning experience is pleasant.

The Law of Primacy.

Primacy, the state of being first, often creates a strong, almost unshakable, impression. For the teacher, this means that what he teaches must be right the first time. For the student, it means that his learning must be right. "Unteaching" is more difficult than teaching. If a new piano pupil learns incorrect finger positions, his teacher will have a difficult task in unteaching the bad habits and reteaching good ones. Every student should be started right. His first experience should be positive and functional so that it can prepare him, lay the foundation, for all that is to follow.

The Law of Intensity.

A vivid, dramatic, or exciting learning experience teaches more than a routine or boring experience. A student of literature is likely to gain greater understanding and appreciation of the play *Macbeth* from seeing it performed than from merely reading it. He can learn more about firefighting from watching someone fight a fire than from listening to a lecture on the subject. The law of intensity, then, implies that a student will learn more from the real thing than from a substitute. Since the classroom imposes limitations on the amount of realism that can be brought into teaching, the teacher should use imagination in approaching reality as closely as possible. Mockups, colored slides, movies, filmstrips, charts, posters, photographs, and other audio-visual aids can add vividness to classroom instruction. Demonstrations, skits, and panels do much to intensify the learning experiences of students.

The Law of Recency.

Other things being equal, the things most recently learned are best remembered, while the things learned some time ago are remembered with more difficulty. It is sometimes easy, for example, to recall a telephone number dialed a few minutes previously, but it is usually impossible to recall an unfamiliar number dialed a week earlier. The teacher recognizes the law of recency when he carefully plans a summary for a lesson or an effective conclusion for a lecture. He repeats, restates, or reemphasizes important matters at the end of a lesson to make sure that the student remembers them instead of inconsequential details. The law of recency can often be applied advantageously in determining the relative positions of lectures within a course of instruction, and it is followed in scheduling briefings immediately before missions.

All the laws of learning are not apparent in every learning situation. These laws manifest themselves singly or in groups, and for purposes of this text, it is not necessary to determine which law operates in what situation.

RETENTION

This section and the next deal with two intimately related aspects of the learning process: permanency of learning and transfer of learning. In some ways it is difficult to separate the two. Generally, transfer of learning means taking a thing out of its learning environment, and using it in another situation. Obviously, a student cannot transfer his learning to a new situation unless he remembers it. Therefore, most of what the instructor does to help a student remember also helps him to transfer.

All learning implies remembering, for if nothing were left over from previous experience, nothing would be learned. A subject of great interest to the student of learning and of real concern to the teacher or instructor is that of retention. The human being without memory could only respond reflexively or with random behavior to each situation. In fact, it is typical of almost every person to regret that his memory is not better. Names are forgotten; keys are mislaid; wedding anniversaries slip by; and such oversights not only cause embarrassment, but may be inconvenient or damaging. Every student facing an examination is coming to grips with the basic problem of remembering. He wonders how he can learn so that he will remember when he is confronted with the exam questions. He ponders over the fact that he has forgotten what was said in the lectures early in the course. Interestingly, one's memory for some things is remarkably good. Even after years of no practice, proficiency in riding a bicycle is regained with little relearning. Learning, retaining, recall, recognition, and forgetting are clearly interdependent processes. Whatever makes for good learning is advantageous because it facilitates retention in all of its aspects. Conversely, poor learning is generally followed by quick forgetting.

Theories of Forgetting.

A consideration of why people forget may point the way to helping them remember. Several theories account for forgetting:

DISUSE. On the basis of logic it has long been argued that a person forgets those things which he does not use. The high school or college graduate may be saddened by the small amount of factual data he has retained several years after graduation. Since the things he does remember may be only those he uses in his job, he concludes that forgetting is the result of disuse. But the explanation may not be quite so simple. Experimental studies have shown, for example, that a hypnotized person can describe specific details of an event which he is not normally able to recall. Apparently the memory is there, locked in the recesses of the mind. The difficulty is in summoning it up to conscious thought.

INTERFERENCE. One of the most promising theories holds that people forget a thing because a certain experience has overshadowed it, or that the learning of similar things has intervened. This theory might explain how the range of experiences after graduation from school causes a person to "lose" knowledge. In other words, new events displace many things that had been learned. From experiments, two conclusions about interference may be drawn: (a) Closely similar material seems to interfere with memory more than dissimilar material. (b) Material not well learned suffers most from interference.

REPRESSION. Freudian psychology advances the view that some forgetting is due to the submersion of ideas into the unconscious mind. Material that is unpleasant or produces anxiety may be treated this way by the individual, but not intentionally. It is subconscious and protective. The repression theory does not appear to account for much forgetfulness of the kind discussed in this chapter, but it does tend to explain some cases.

Retention of Learning.

Each of the above theories implies that when a person "forgets" something, it is not actually lost; rather it is unavailable for recall. The teacher's problem, then, is how to make certain that the student's learning is always available for recall. The following suggestions can help:

1. Teach thoroughly and with meaning. Material thoroughly learned is highly resistant to forgetting. This is suggested by experimental studies; it was also pointed out in the sections on skill and concept learning. Meaningful learning builds patterns of relationship in the student's consciousness. Whereas rote learning is superficial and is not easily retained, meaningful learning goes deep, because it involves principles and concepts anchored in the student's own experience.

2. Help the student understand a reason for remembering. A desire to remember increases the chances of remembering. It follows, then, that a lack of such a desire increases the chances of forgetting.

3. Help the student develop good study habits. Just as the teacher should teach meaningfully, the student should be encouraged to study for meaning, not just for rote memory. The student should apply himself toward thorough understanding and proficient skills.

4. Help the student to develop an organized program of review. Short spaced periods of review, recitations, and quizzes are helpful. Frequent opportunity for practice is probably the best of all.

TRANSFER OF LEARNING

During a learning experience, the student may be aided by things he has learned previously. On the other hand, it is sometimes apparent that previous learning interferes with the current learning task. Consider the learning of two skills, A and B. If the learning of A helps to learn B, positive transfer occurs. If learning A hinders the learning of B, negative transfer occurs. For example, the learning of addition probably helps the learning of multiplication; learning how to shoot a bow and arrow may help to learn how to shoot a rifle. On the other hand, learning to drive an automobile in U.S. traffic may hinder learning to drive in British traffic, because Britons drive on the left side of the road. For some people, the study of Japanese first makes it more difficult to learn French. Perhaps it should also be noted that the learning of B may affect the retention or proficiency of A, either positively or negatively. While these processes may help to substantiate the interference theory of forgetting, they are still concerned with the transfer of learning.

It seems clear that some degree of transfer is involved in all learning. That is so because, except for certain inherent responses, people interpret new things in terms of what they have already learned.

There are many aspects of teaching that profit from a knowledge of this type of transfer. It may explain why students of apparently equal ability have differing success in certain areas. Negative transfer may be hindering the learning of some; positive transfer may be helping others. This points to a need to know more about each student, what his past experience has been, what he has already learned. In lesson and curriculum planning, instructors should plan for transfer by organizing course materials and individual lesson materials in meaningful sequence. At best, each phase should help the student to learn what is to follow. Materials should not be placed in a sequence that will jeopardize subsequent and more complex learning.

Applicational Transfer of Learning.

The student is frequently confronted with the need to adapt what he has learned to situations that differ from the original learning experience. The purpose of any Air Force school is to prepare its students to function in the situations they will face after they are graduated. A school can seldom simulate completely all the conditions that the student will meet. Therefore, the instructor must teach in such a manner that the student can use what he learns even when conditions change.

The causes of transfer and how it operates have not yet been identified and explained. But no one disputes the fact that it does occur. The significance of this ability for the instructor is that he can and should help the student achieve it.

The following suggestions are representative of what educational psychologists believe should be done:

1. Plan for transfer as a primary objective. As in all areas of teaching, the chance for success is increased if the teacher deliberately plans to achieve it.

2. Make certain that the student understands that what he learns can be applied in other situations. Prepare him to seek other applications.

3. Insure thorough, high-order learning. Overlearning may even be appropriate. The more thoroughly the student understands the material, the more likely he is to see its relationship to new situations. Avoid rote learning, for it does not foster transfer.

4. Provide meaningful learning experiences that build the student's confidence in his ability to transfer learning. This suggests activities that challenge him to exercise his imagination and ingenunity in applying his knowledge and skills.

5. Use instructional materials that help form valid and meaningful concepts and generalizations. Use materials that make relationships clear.

6. Educate the student to use discrimination and judgment in the application of his generalizations.

SUMMARY

This chapter is no more than an entry-level look at the field of educational psychology, which contains many significant areas. The chapter itself is but a summary of one area: learning.

Learning has been studied from at least two major points of view: that of the behaviorists, focusing on outward appearance; and that of the cognitivists, trying to draw inferences of the mental processes themselves. Learning results in a fairly permanent change in behavior as a result of experience. The learning process has many important characteristics including these:

Learning is
- purposeful.
- multi-faced.
- partly a common process and partly an individual one.
- a building process.
- a process of internalizing experience.
- an active process.

In planning for teaching, the teaching methods should reflect the nature of what is to be learned. Nine of the principles involved in the learning of skills were described. The learning of concepts and generalizations depends on a broad range of experience and careful guidance.

The laws of learning provide useful insights into the process of learning. The law of effect is especially significant—it states that learning is strengthened when accompanied by satisfying or pleasurable conditions.

The central questions in education deal with retention of learning and transfer of learning. Disuse, interference, and repression may account for forgetting. Transfer of learning is involved either when the learning of one task affects the learning of another, or when the learner adapts what he learns for use in new situations. The key to both is thorough learning of a relatively few really important concepts and generalizations. This leads to meaningful learning, anchored in the student's experience.

CHAPTER 2

Writing

Instructors sometimes ask, "Why should I be concerned with writing? My job is to teach, not to write. Why do I need to worry about improving my writing ability?" The answer may be found by analyzing the skills involved in instructing. These skills are many and varied and place heavy demands on the instructor's ability. One skill, however, stands out in importance: communicating.

The primary task of the instructor is to create a clear channel of communication. But the channel alone is not enough. More is required than a communication line with the instructor at one end and the student at the other. A flow and exchange of *ideas* must occur to make effective use of the line.

So what is an *idea?* Ideas are intangible; they cannot be seen, smelled, or touched. The instructor cannot dole them out as if they were peanut butter sandwiches. If he could, instructing and learning would be simple. The instructor faces the problem of giving form and substance to his ideas. He usually solves it by putting his ideas into words.

EFFECTIVE WRITING

Words are the primary means by which the instructor breathes life into his ideas. Words can describe, illuminate or limit ideas, and give them meaning. Words can give an idea the capability of moving from the mind of the instructor to the mind of the pupil. Words can give an idea the "communicability" that is vital to the learning process.

Since the instructor must work with ideas built of words, he needs to become a skilled user of words to be an effective teacher. After he skillfully constructs the idea and gives it "communicability," he must complete the process by deciding upon the best means of communicating it.

Usually he decides to verbalize, or speak, the idea. This is often the ideal means. The voice is an excellent teaching tool. It can emphasize and dramatize by inflection. It can bring tonal variety and interest into the classroom. It can be flexible and dynamic.

Sometimes, however, the instructor selects another means of transmitting ideas. Some ideas can be grasped more easily, and retained longer, if written where the student can "see" them. Often he needs time to consider an idea. The spoken word does not always present such an opportunity. The idea is voiced and if not grasped quickly, glances off into space. It does not register. But, if the idea is written, the student can read and learn at his own pace, not the instructor's. This is why the instructor must be concerned with writing and strive to write well.

The kinds of writing the instructor must do will vary. The purpose for which he writes usually determines the form his writing takes. In some cases, he might be called upon to write an entire textbook or workbook. More frequently, however, the requirements will be less ambitious and the style of writing less formal.

Writing can take many forms: a basic lesson plan, a handout containing a problem for the class to study and discuss, or material for an outside reading assignment to add depth and scope to the classroom presentation. Some writing efforts are only indirectly related to the classroom. For example, the instructor may write a report for an educational journal or submit recommendations to the curriculum committee. Writing tasks occur in many forms, but whatever the form they are a necessary part of instruction.

If the instructor has developed the ability to write well, two worthwhile results occur. First, his writing produces a favorable learning environment. Through his choice of words, his ideas spring to life and become indelibly impressed upon the minds of his students. Writing accomplishes the purpose for which he did it, namely, the student learns. This is the primary effect.

The other result of good writing is that an instructor teaches good English, because he teaches his subject in English. The way he uses the language becomes a model for the student. If the model is a good one, the student profits; if the model has flaws, the student suffers. In either case, the effects are long-lasting. A former teacher, President Lyndon B. Johnson, stressed this thought in 1964 when he sent this message to the President of the National Council of Teachers of English:

> . . . Those who teach our national language inevitably exert an enormous influence on the course of our national affairs. When badly taught, our language becomes an imprecise and ineffective means of communication. It blurs our view of the past, our understanding of the present, and our vision of the future. When taught well, or better still, when taught superlatively, our language becomes a positive force in the advancement of both the cultural and economic life of our land.

Effective writing, then, can pay a dividend in addition to transmitting a message. If the student is exposed to an instructor who expresses his thoughts lucidly, he gains an appreciation of the power of language. This appreciation often materializes in the student's desire to become more literate, to express his own ideas clearly and competently. He pays the instructor a great compliment when he patterns his language after the instructor's example.

But what of the instructor who possesses no talent for writing, yet must write? Time spent complaining or worrying about it is wasted. If the instructor must write, he should try to improve his writing skills. How? Where does he find the time?

There can be no quick and easy answer to such questions, because there is no quick and easy way to acquire a skill. Facility in any skill grows through conscientious, purposeful practice. It is achieved slowly but surely as the individual devotes time and effort to it. So it is with writing. Developing writing facility takes time and effort, but any instructor who has worked hard to acquire it will agree that the dividends are worth the investment.

The starting point for improving writing skills is obvious: find the areas that need improvement. Many people struggle for years knowing that they do not write well, yet never know why. They recognize writing as a problem, but they never try to analyze the problem; they never attempt to pinpoint the reasons why they do not write effectively.

Of first importance in writing, as in all other mental work, is the ability to organize. A workable system for organizing your material is the basis for developing your ideas. After you have carefully chosen your main ideas and planned ways to support them, you are ready to word your thoughts.

To say what you mean and say it well, you must know what acceptable language is, and you must be able to use it. In other words, language must be your servant, not your master.

Good writing is more than a matter of good usage and acceptable mechanics. It is also a matter of style. You want to express your ideas naturally and effectively. To achieve such a style you must follow orderly methods. And that takes us back to the first requirement we mentioned: You must be able to organize.

ORGANIZING BEFORE YOU WRITE

After clearly identifying his specific purpose, every good writer organizes his ideas before beginning to work on a first draft. He thinks about what he is going to write; he goes through a problem-solving process of some kind. His first big objective is to devise a logical framework of topics to guide him as he writes. You have not yet started building such frameworks for your own use, but you have analyzed other people's lectures and written products to see how they were organized. This experience will help you now that you are ready to start working out your own patterns of organization for writing.

To write clearly, you must first think clearly. So think about your material, and organize your ideas in a systematic way. Carefully think through what you want to say and how you hope to say it. If possible, talk your organization over with a colleague.

There are many systems of organizing. If you do not have one, try the one described in the following paragraphs. It works.

Clarify Your Purpose.

Start by clarifying in your own mind your purpose in writing. Probably the best way to do this is to ask yourself some questions. As a beginning, ask yourself, "Why?" If you do not know why you are writing, the chances are your reader will not know either.

Your next question could be, "Who will read it?" Since you are preparing a message for a reader, you should know who he is. The answer to this question will strongly affect everything else you do on your writing project. You would approach a subject in one way if you were writing to the Joint Chiefs of Staff, but in an entirely different way if you were writing to the crew chiefs on the line.

Next, ask yourself, "What reaction do I want my reader to have?" Your answer to this question may be different every time you write. Do you want him to learn a principle, a procedure, or some facts? Do you want him to give active support to one of your projects? Or do you want a reaction that lies somewhere between these two? Whatever the desired reaction, you must determine it at the outset. It will affect everything you do from the time you start writing until you turn out the finished written product.

Limit Your Subject.

Most subjects dealt with in the Air Force are broad, but when we start to write, we usually intend to cover only a segment of one of these broad subjects. You should take some time to decide exactly how much of your subject you want, or need, to cover. Limit yourself to the part needed to satisfy your purpose. Saluting, for example, is part of the broad area of military customs and courtesies. If your purpose is to tell the reader about saluting, recognize this limitation as you organize your ideas. Then you can concentrate on this one phase of the broad subject.

If you are writing about a familiar subject or a routine matter, limiting the subject will not take much of your time. But if you are writing in a new area, plan to spend some time on this step. This preliminary work will save valuable time later by allowing you to devote your efforts to only that part of the subject needed to satisfy your purpose. Limit your subject so that you tell your reader what he needs to know—no more and no less.

List Specific Ideas.

Now write down the ideas that have been popping into your head. Up to this time your work has been largely mental, but as you thought through your purpose and the span of your coverage, you were probably developing some ideas without even trying to do so. Get hold of those ideas. Don't worry about arranging them. Put them down as they come to you. At this stage, do not lose a single idea. The lost idea might be just the one that would put your point across to the reader.

When you have assembled all your ideas, check each one against your purpose and the subject as you have limited it. See for yourself if these are the ideas you need. You may notice that some ideas you've listed don't seem to fit. If they don't, get rid of them. If you are not sure, hang onto them. If you actually don't need them, you will find that out in the next step. In checking the ideas you already have, you may think of others that you need. When you think your list is complete, you are ready to go to the next step.

Group Specific Ideas Under Main Ideas.

The specific ideas that you have listed at random can probably be grouped under two or three broader ideas. The work you do at this time will help your reader relate the ideas to each other and to the subject as a whole. It will also help you to see the ideas in better perspective, which is important now that your paper is beginning to take definite shape.

At this point you should again check your ideas against your purpose and your subject. At the end of this step, you will know what you are going to say, and you will be in a position to decide how you are going to say it. If there are any gaps in your planning or if you have covered too broad an area, these weaknesses will show up at this point. Before you proceed, make sure you have listed all the ideas you will need to get your point across to your reader.

Pick a Pattern.

Take another look at your reader, remembering that you have a message to get across to him. To do this, you must present your ideas so that he can easily read and understand them.

The reader expects ideas to be presented logically, but he has psychological needs too. Since you can choose from several patterns of presentation, pick the one that you think will have the greatest appeal for your reader.

Of the many patterns used in presenting ideas, the most common are the topical, the reason, the time, and the space patterns. You should learn to use these standard patterns and to determine which one is most suitable for your subject. Your choice of pattern will be influenced by your specific purpose.

THE ENUMERATION OR TOPICAL PATTERN. If your ideas seem to fall naturally into a listing (or qualities, characteristics, or specifications, for example), you should probably use this pattern. In the topical pattern, you arrange the ideas in their natural sequence or in the order that best enables you to move easily from one idea to the next.

THE REASON PATTERN. If you wish to convince or persuade the reader, this pattern may be your best guide. It lets you show the logic of your point of view by presenting the reasons which support it. These reasons serve as your main points. You must, of course, amplify and prove each main point by using various forms of support, such as examples or statistics.

The problem-solution method is a variation of the reason pattern. The writer states the problem, discusses the facts bearing on the problem, proposes and tests solutions, draws conclusions, and recommends specific action. This arrangement acquaints the reader with the process used in solving the problem.

THE TIME PATTERN. This is perhaps the most familiar pattern. Followed in the writing of history, this pattern is useful whenever time or the sequence of events (as in a standing operating procedure) is important. In following the time pattern, you begin at some point in time and continue, point by point, without skipping around, to another point in time. You may start with the earliest point in time and work forward to the latest, or you may start with the most recent and work back.

THE SPACE PATTERN. Some people call this classic pattern the geography-book approach. It is particularly useful when the information has to do with location. Here again, you must stay on course. You would, for example, in describing a building, start at one end and proceed to the other in an orderly way, not start in the basement, climb to the roof, and finally get to the entrance.

These four patterns are the ones most commonly used in military writing. Sometimes you may want to use combinations of them, particularly if your paper is to be a long one. You should allow yourself enough time to decide which pattern or combination of patterns will serve you best in getting your ideas across to your readers. After planning what you are going to say and how you are going to say it, you are ready to write down a brief orderly record of these plans.

Make an Outline.

During the organizing process, you have done considerable thinking. Your final step is to collect this thinking and put it down on paper in outline form. This outline will be the skeleton of your final paper.

Since you will use your outline as you write, make it as detailed as your needs dictate. If your paper is to be short or if you know your subject well, you may need to jot down only a few words. If you are writing about an unfamiliar subject, you may need a detailed outline that fills several pages.

A good outline helps you in three important ways: It helps you concentrate on one point at a time. It keeps before you your decisions about what and what not to include. Finally, it helps you write in spite of interruptions. In brief, it gives direction to your work and, consequently, saves time and energy.

At first glance, this appears to be a very time-consuming system. If you try it, however, you will find that it is economical in the long run. You will save more time in the writing and rewriting stages than you have had to spend in organizing. As you write, your flow of words will be surprisingly smooth because you will have already thought them through. This reward alone will repay you for the effort you spent in organizing. Editing and revising your first draft will be a relatively easy task. If you have thought your ideas through carefully before writing, your first draft will probably need only minor editing and rewriting. In summary, then, if you do a careful job of organizing, the writing itself will require less time and effort, and you will have a better product.

DEVELOPING YOUR IDEAS

After organizing your material, you know what you are going to say, and you have a plan for saying it. Now you must use your plan to get your information across to your reader. A good way to do this is to show him how you have developed your ideas by the way you construct paragraphs. You could express your ideas fully without paragraphing, but your reader would probably have a hard time following you. Carefully planned paragraphing is essential to effective writing.

Write from Your Outline.

Every main point in your outline calls for at least one paragraph. You want to express that main point or idea in such a way that your reader will understand. You want to state it clearly and emphatically and in a manner that shows him how it relates to your overall purpose in writing. Because of this, it is well nigh impossible to paragraph effectively if you have not organized your thoughts very carefully. The man who writes along for a while and then glances back to pick some nice spot for an indentation has not helped his reader a bit. Each paragraph should be a signal from the writer to the reader to look for something new.

Your signaling job will be much easier if you remember that a good paragraph must have these three elements: a main idea, support for that idea, and transitional material. Let's consider these elements in a little more detail.

Establish Your Main Ideas.

A point you want to make is a main idea. In a paragraph the main idea appears in the topic sentence, which is the most important single sentence in the paragraph. And since it is the most important sentence, you should be careful about where you put it.

For the purposes of most military writing, the best place to state your main idea is at the beginning of the paragraph. The first sentence is the easiest to locate and therefore has the most emphatic position. This initial position is also particularly good if you develop your ideas deductively, as most of us do.

Another possibility is stating your main idea at the end of the paragraph. In inductive development, this position is very effective. Also, you might want to use this position to keep your reader from forgetting your main idea when the paragraph is long. There are serious disadvantages, however, to stating your main idea at the end of a paragraph. It is difficult to locate and could be missed, particularly by someone scanning your material. As a rule, state your main idea at the end of the paragraph only when you have to.

Support Your Main Ideas.

Ordinarily you will find it difficult to put your main idea across in only one sentence. You must clarify, amplify, reinforce, or emphasize the idea to make sure your reader will understand what you are saying. To put it simply, you must support your main idea.

The most important thing to consider in selecting material for support is its appeal for the reader. Try to use material that falls within his core of experience.

There are many ways to support ideas. You can use a story or an illustration or an extended example. Sometimes you can use an analogy effectively. Statistics can help you emphasize a point, but avoid overusing them.

A support frequently used in military writing is reason. Your statement of the main idea, for example, may make your reader wonder, "Why?" or "What caused this?" If it does, you must give him an answer. Give him the reason.

Remember that in each paragraph you use support to clarify, amplify, reinforce, or emphasize your statement of the main idea. Always try to select supportive material that suits the experience and interests of your reader.

Use Transitions to Carry Your Reader Along.

After you have stated and supported your main idea, you have expressed it completely. Now you need to connect this idea with the next. You may think your train of thought is very easy to follow, but you must ask: Will your reader find it so? You should use transitions to make sure he can follow your ideas. To him, your transitional material will probably be the most important of the three necessary elements in the paragraphs you are writing.

You have four transitional devices to choose from: the paragraph, the sentence, the phrase, and the word. They will help you do more than one job. You can use them to associate new material with what has gone before, to forecast what is coming next, or to orient the reader so he will know exactly where you are.

Suppose, for example, that you are writing a long paper in which you want first to talk about semantics, then about writing, and finally about speaking. You will probably organize your material into three sections. You could go directly from one section to the next, stating all your ideas completely, but your reader might not be able to follow you. He can more easily go along with what you say if you use a short transitional paragraph between the sections. Each transition will allow him to stop a minute, catch his breath, and get ready for the new ideas coming up. Such a paragraph might read like this:

> We have seen that words don't mean the same things to everyone. Now let's consider some difficulties that arise when we want to communicate with others by speaking and writing words. We will look first at speaking and then at writing.

Notice that the paragraph is short. Notice also that the first sentence ties in with preceding material. The second sentence forecasts what is coming next so the reader can be ready for it. The last sentence indicates the order in which the points will be made.

A transitional device more common than the paragraph is the transitional sentence. Here is an example of a transitional sentence used to forecast.

> . . . transitional, paragraphs should be short. Now, let's look at the next transitional device, the transitional sentence.

In this case the transitional sentence comes at the end of the paragraph. We could very easily put it at the beginning of the next paragraph:

We have seen how paragraphs can be used for transitions; now let us examine the sentence as a transitional device.

In both cases you are giving the reader a chance to catch his breath before he goes to the next idea. Notice that the sentence in each example is short and to the point.

Transitional phrases are probably the most common of the transitional devices. You can use them whenever and wherever you need them. They will fit into almost any sentence either as an opener or as a conclusion. Let's look at some examples.

On the other hand, we don't want to write so simply that we bore the reader.

Assume that you have told your reader he should write simply and you now want to caution him not to overdo it. The phrase "on the other hand" tells him to stop a moment and look at the other side of this question. Here you are orienting the reader. Another example might be this:

At the present time Air Force officers need to train themselves to become better writers.

The phrase "at the present time" makes it perfectly clear to the reader that you aren't talking about the past and you aren't thinking about the future. You are talking about right now, and you want to be sure that he knows it.

You will often find that you do not need a paragraph, or a sentence, or even a phrase to do your transitional job. A single word may be all that is necessary. When you are striving for brevity, the transitional word can be very useful. There are many transitional words. Ordinal numbers, such as "first," "second," and "third," are excellent. Words like "therefore," "consequently," and "however" will frequently do the job for you. In your reading notice how good writers often use single words to indicate a transition.

First you should decide what your purpose is.
Therefore, we should always write for our reader.

In the first sentence, the word "first" is used purely for transitional purposes. It indicates that an order of some kind is important. In the second sentence, the word "therefore" tells the reader to get ready for a summary or conclusion. In both examples the sentence is complete without the italicized word. The only purpose of these words is to help the reader follow the idea. You, the writer, can do without them, but your reader will have a better chance of getting your idea if you put them in.

Probably the best transitional device is good organization. The ultimate in good writing is to have such good ideas and to have them so well organized that the reader can follow them easily with no outside help.

In devising transitions to help your reader over the rough spots, remember to use the simplest ones possible. Never use a paragraph when a sentence will do. Never use a sentence when a phrase will do, and never use a phrase when a word will do.

SELF APPRAISAL

In addition to organizing your ideas before you write and developing your ideas in carefully planned paragraphs, you can become more effective in writing by initiating a program of honest self appraisal. This approach can identify many writing faults. Too often, the instructor writes under the pressure of a crowded schedule, rushing through the writing task and not taking time to read what he has written. Even a cursory glance would probably reveal careless mistakes, made because of haste or inattention.

A quick backward glance is not enough, however, if the instructor wants to perform a thorough self-appraisal of his writing. He should look critically at four important aspects: clarity, appropriateness, directness, and correctness. A checklist (Figure 2) is offered to help conduct a systematic writing analysis. Although limited to these four aspects, a checklist might include other criteria. However, if the writing is clear, appropriate, direct, and correct, it will probably be good when measured by any other yardstick.

This checklist is like any other measuring tool. The writer must understand what it measures and how to use it, but before he uses it, he needs to consider the meaning of each criterion. The next few paragraphs establish these guidelines.

Although each of the four aspects is treated as a separate entity, they are inseparable. They have been isolated for purposes of analysis, but each depends upon the other and all combine to produce effective writing. By studying the checklist carefully, the writer should have a clearer understanding of what and how it measures; he should also be able to use it more efficiently.

CLARITY (Did you communicate clearly?)

- Does your *main* message come through easily?
- Are your ideas logically *organized?*
- Have you *supported and developed* your ideas?
- Have you weeded out *unnecessary details?*

Clarity has been placed intentionally at the beginning of the checklist. It is the first quality the writer must strive for and the first to look for when he appraises his efforts. The reason is simple: if the meaning is not clear, he has wasted both his time and the reader's. If the idea does not stand out as clearly on the written page as it did in the writer's mind, he has failed to move that idea, whole and intact, from the transmitter to the receiver. At best, his communication is only partially successful. At worst, he may not only fail to communicate the intended idea, but he may instead implant one that is false, distorted, or misleading.

It is not always easy for the writer to determine whether or not he has expressed his ideas with clarity. If the reader is required to perform an act as a result of the writing and if he performs that act, the communication must have been clear. The determination, then, is simple, for example, when an instructor gives written instructions for certain student activity. But when the writing does not call for an overt response, measuring the degree of clarity is more difficult. The writer must judge his effectiveness by looking at the writing itself, not at the result of the writing.

In judging the clarity of his writing he should look for three essential characteristics: *unity, coherence,* and *emphasis.* If the writing possesses all three, he can feel reasonably sure that it is clear.

Unity means that a strong, central theme is established in the first few sentences and adhered to throughout. It means that the writer selects a single road to travel and stays upon it, avoiding side-trips which delay his arrival at his intended destination. He makes it easy for the reader to travel without confusion, by marking the message unmistakably and keeping it in plain sight throughout the course of the writing.

Coherence means that the separate parts read in a natural, easy flow from one idea to another. The reader never has to retrace his tracks to find where he wandered away from the thought-path. Writing that is coherent in total effect is achieved when each part is coherent. The sentence structure follows one of the customary patterns; if it varies, the meaning remains unmistakably clear. Each paragraph is built according to a logical arrangement and is essential to the plan devised by the writer. Each sentence in the paragraph contributes something to the idea and advances the meaning. The overall effect, therefore, is a steady progression of thought along a predetermined route.

Emphasis requires the writer to sort and weigh his ideas before he writes. Some are major ideas; some are minor. Others are in neither category and he discards these quickly. In his writing, he emphasizes the relative importance of his ideas, which he can do in many ways. He can do it boldly and directly by introducing a major idea with a phrase that says, "This is important." He can take advantage of mechanical means, by underlining his main ideas or placing them in italics, or using headings and subheadings. All of these devices are helpful and are used in this text.

Emphasis can also be gained by more subtle methods. One of these is proportion. If the writer wishes to present two ideas of unequal importance, common sense indicates that more attention should be given to the more important one. He therefore gives the major idea emphasis by devoting more space to it, developing it more fully, and by supporting it in greater depth and detail. Repetition also aids in emphasis. This does not mean merely repeating the idea in the same way. Rather, it means focusing attention on the same idea from more than one angle. Finally, the skilled writer knows that a major idea should never be buried in the middle of a paragraph or a chapter. The reader unconsciously looks for key ideas at the beginning of a selection and retains them if they are re-emphasized in the concluding sentences.

The essentials of clarity—unity, coherence, emphasis—make it possible for the writer to answer all of the first four questions on the checklist with a positive, confident, "Yes."

APPROPRIATENESS (Does the writing fit its environment?)

- Does the general tone suit the *subject matter?*
- Have you considered who your *reader* will be?
- Have you considered his *knowledge level?*
- Does your writing style seem to fit *you?*

Writing, to be appropriate, must fit its environment. This consists of several factors, all of which influence tone and style.

The nature of the subject is the first factor. If the subject is a serious one, the general tone of the writing should match. This does not mean that the writing must be dull; it can still be interesting, although serious. Treating a serious subject in a light and humorous vein could entertain the reader but cause him to miss the importance of the subject matter.

Another factor to be considered under "Appropriateness" is the reader. The reader is a key factor in deciding the style, level, and tone of the writing. In this respect, the instructor is more fortunate than most professional writers. He has a clear picture of his reader, because he usually writes for his students. He knows how much knowledge the student has and how much he wants and needs. Knowing this, the instructor can tailor his writing to fit the r[illegible]'s requirements.

Although the primary pur[illegible] of writing is to express ideas, the manner in which they are expressed creates an impression of the writer in the reader's mind. This why the third factor in writing environment—the writer himself—should be considered.

Writing mirrors the writer. If it reflects the way he sincerely feels about the subject, the message "rings true." The reader senses this sincerity and respects the ideas presented. He may not accept them, but he gives them honest consideration because he has unconsciously formed a favorable image of the writer as a person.

An unfavorable impression can also be formed. The reader can sense ideas that are presented artificially or insincerely. He quickly spots superficial understanding, even when the writer uses a veneer of flowery language to disguise his lack of knowledge. A glib vocabulary will not cover up the writer's inadequacies.

Recognizing these facts, the effective writer tries to convey an image of the kind of person he really is. He seeks to project a thorough understanding of himself by placing his thoughts on paper as simply and honestly as he can. As a result, he creates a favorable impression for both his ideas and himself.

If the writer can answer the four questions under "Appropriateness" in the affirmative, his writing will fit its environment.

DIRECTNESS (Do your ideas come into focus quickly?)

- Have you avoided *long, involved sentences?*
- Have you chosen *simple words,* rather than flowery or unusual ones?
- Will the reader understand all *technical terms?*
- Did you use *active verbs* whenever possible?
- Did you use *personal pronouns* where appropriate?

The next item on the checklist, "Directness," describes writing that can be easily read and quickly comprehended.

The writer can best achieve directness with simple, uncomplicated sentences. He must seek and use words that his readers can grasp effortlessly. One might think that such writing would tend to be cramped and monotonous, but this is not necessarily true. Sentences can be varied in both word arrangement and length for good readability. Word choice need not be limited to a small vocabulary. On the contrary, a large vocabulary enables the writer to choose exact words to convey exact meanings.

To achieve directness, write as you talk; in other words, write conversationally. When speaking, the average adult presents his ideas simply and directly; his listener understands him. Unfortunately, when he writes, he sometimes fails to express himself quite as effectively. If he writes his ideas as naturally as he speaks them, his writing would improve, and his reader's comprehension would increase in direct ratio.

For example, an instructor usually speaks in active terms. If he announces, "Please finish your homework by tomorrow," his students have no difficulty getting the message. It gets to the point, it is personal, and it is exact. No room is left for misunderstanding. But consider how the same instructor might write the same message: "It is requested that students complete their prescribed assigned homework as soon as practicable." The message has become indirect, impersonal, and indefinite. The response from the written instructions will probably be less satisfactory than that from the spoken version.

One might deduce that the most effective solution to this problem is to give only verbal instructions, but of course, this is not the answer. Written instructions are often best, and can be as effective as oral, if they are written naturally and directly. The writer will then be able to answer all the questions under the criterion, "Directness," with a direct and positive "Yes."

CORRECTNESS (Have you met the standards of accepted usage?)

- Are you sure about your *spelling?*
- Do your *subjects and verbs agree?*
- Have you *punctuated* correctly and where necessary?
- Are your *pronouns* in the right case?
- Have you *capitalized* correctly?

The final item on the checklist, labeled "Correctness," is probably the one used most often by the reader to form an opinion of a writer. The use of the English language is the standard by which the reader forms his opinions of the writer and ascertains if his ideas are worth considering. This is why "Correctness" is so important. The writer may word his message clearly, but if the reader decides that it stems from an uneducated

CLARITY *(Did you communicate clearly?)*	YES	NO	I DON'T KNOW
Does your main message come through easily?			
Are your ideas logically organized?			
Have you supported and developed your ideas?			
Have you weeded out unnecessary details?			
APPROPRIATENESS *(Does the writing fit its environment?)*	YES	NO	I DON'T KNOW
Does the general tone suit the subject matter?			
Have you considered who your reader will be?			
Have you considered his knowledge level?			
Does your writing style seem to fit you?			
DIRECTNESS *(Do your ideas come into focus quickly?)*	YES	NO	I DON'T KNOW
Have you avoided long, involved sentences?			
Have you chosen simple words, rather than flowery or unusual ones?			
Will the reader understand all the technical terms?			
Did you use active verbs whenever possible?			
Did you use personal pronouns where appropriate?			
CORRECTNESS *(Have you met the standards of accepted usage?)*	YES	NO	I DON'T KNOW
Are you sure about your spelling?			
Do your subjects and verbs agree?			
Have you punctuated correctly and where necessary?			
Are your pronouns in the right case?			
Have you capitalized correctly?			
TOTALS			

Figure 2. Writing Analysis Checklist

source and cannot therefore be important, he might ignore it.

For the instructor, correctness is extremely important. If his writing contains many errors in usage, his students might unconsciously transfer this weakness to his ability to instruct. They may lose respect for the instructor's ideas, even though these ideas are sound and are based on a complete knowledge of the subject matter.

What is "correct usage"? Most grammarians say that correctness is determined by the way educated persons use the language. Consequently, the rules are not hard and fast and unchanging. However, there are some generally recognized standards that determine correct and incorrect usage. If the skilled writer develops a knowledge of these standards, he increases his confidence in language usage and insures respect for his ideas by students.

Rules of language usage are similar to traffic rules. When one is learning to drive, the rules are new and he must consciously think what he must do to comply with them. For example, when he sees a stop sign, he must think about stepping on the brake, shifting gears and, if he intends to turn, giving the correct turn signal. Learning to abide by language rules is somewhat similar. The writer with little experience must think about the rules to comply with them. Experience, however, makes compliance almost automatic. Just as the driver gets a "feel for the road" and drives almost effortlessly, so the writer acquires a "feel for language" and writes easily without worrying about the rules.

The five areas covered by the questions under "Correctness" do not include all the rules of correct usage. However, they are the areas in which the most common and obvious errors occur. The writer who is reasonably confident about his spelling, verb agreement, punctuation, pronoun selection, and capitalization probably meets the other standards of correct usage as well. On the other hand, if he has doubts about any of them, he probably has other language-usage problems, also.

CHECKLIST

The checklist (Figure 2) contains a key question in parentheses after each criterion. The writer should first try to answer honestly, in his own mind, each key question. If he can answer all of them with a firm, confident "Yes," he may have little need of the other questions on the checklist.

However, if he cannot be positive about some of them, he should go through the checklist and try to answer the other questions. In some cases he may not be able to answer the questions with a definite "Yes" or "No." If not, he should check the "I don't know" column to indicate areas that might need improvement.

After he has used the checklist to identify areas that need improvement, the writer can proceed immediately to work on them. Many times he knows how to write better, and, if so, the appraisal will guide him as he edits and re-writes. Editing and re-writing cannot be overemphasized as a method of writing improvement. The world's finest writers often re-write their material many times before they are satisfied with it. The instructor can profit by their example if he makes it a habit to re-write all his own material at least once, and even more, if necessary.

Of course, if the instructor does not have the basic knowledge he needs to correct the weaknesses in his writing, he must find help from others. In many cases, he can get the help he needs from an authoritative reference book. Air Force Manual 10–4, *Guide for Air Force Writing,* provides much needed guidance. A good dictionary is also helpful, especially on questions of correctness and usage. In addition, the instructor should have access to a reputable guide or handbook on writing. If he feels the need for a more complete review of basic fundamentals, he should either enroll in a writing course or undertake a self-study course. The base education office can provide information and guidance to assist him in this respect.

SUMMARY

The ability to organize is basic to good writing. In fact, a system for organizing is your main tool in developing the ideas you wish to express in writing. Without organizing, you will not think clearly and therefore cannot write clearly. In developing your ideas and putting them into words, remember that each paragraph should have a main idea, support for that idea, and transitional material.

CHAPTER 3

Lesson Planning

Planning a lesson is "planning for learning"—quickly said but not easily done. Like most of life's activities, the quality of the planning usually determines the final results. Every successful executive or professional man knows that the price of excellence is careful planning. The outstanding lawyer spends hours in preparing a case before presenting it in the courtroom. The forceful minister does not ad-lib his sermon; he plans for days or weeks in advance. In preparation for the big game, the competent coach spends hours in planning the plays and in watching his team execute them. Should such a complicated process as learning be attempted with less attention than is given to the routine activities of life? The answer is obvious—the effective instructor devotes much time and energy to the preparation of each classroom session.

To insure the greatest probability of learning taking place, the efficient instructor carefully selects and arranges activities that will bring about selected changes in the behavior of his students; behavior that is consistent with their abilities and interests. Only through careful planning can the instructor be certain that he is including all necessary ideas and properly organizing the material to help the students achieve the lesson objective.

The complete cycle of lesson planning, after the topic has been selected, includes six steps: establishing the lesson objective; developing the desired learning outcomes; researching the topic; organizing the material; selecting the instructional method; and preparing the lesson plan. Although the order of performing these steps may vary, this sequence of planning is likely to produce the best learning situation in the shortest period of time.

ESTABLISHING THE LESSON OBJECTIVE

To achieve the learning goals of a complete course in an efficient manner requires that those goals be separated into segments which can be clearly defined and accomplished. These segments commonly include blocks and phases of instruction and individual lessons. Similarly, clear definition and segmentation of *lesson* goals or objectives is a prerequisite to efficient lesson planning. It is with this latter task that this section is primarily concerned, but the same guidelines should be applied to all levels of course planning.

Usually, in military service schools, it is the responsibility of course planners to insure that each lesson objective can be achieved within the time available. Even though his responsibility may be shared, it is the *classroom instructor* who must ultimately decide what his students can be expected to learn during each period of instruction. To make this decision, the instructor must first analyze the prior experience of his students with the material to be learned—as discussed in the chapter on the psychology of learning. Having made this analysis, the instructor is prepared to make a reasoned judgment about where his students must start and how far they might go within the time available. Concurrently, he must consider two other limiting factors: the physical facilities available and his own background and abilities as an instructor. Having analyzed the possible effects of available time and facilities and of his own and his students' background and abilities, the instructor should be ready to make a clear, concise statement of the change in behavior (learning) which he may logically expect his students to achieve in that particular lesson. The first step in lesson planning is, thus, for the instructor to analyze the lesson and decide on the basic objective for a particular learning experience, while keeping the final goal, the phase or course objective, clearly in mind. In stating individual lesson objectives, the instructor should plan for these requirements: focusing his attention on the needs of the student, clearly specifying the subject, determining the desired level of learning, and defining the purpose of the lesson.

Focus on Students.

The objective of a lesson is the end result the lesson should achieve; it should be expressed in terms of what the student is to learn rather than in terms of what the instructor contributes to the learning process. Nevertheless, instructors often tend to state their own objectives rather than the students' intended learning objectives. They may state that their objective is "to teach . . . ," "to explain . . . ," or even "to guide the student in . . ." something. To put the focus of the lesson where it rightly belongs—on student learning—the instructor's statement of his lesson objective should begin "the objective of this lesson is *for each student to* . . . ."

Specify Subject.

A second essential element of any lesson objective is a statement of what is to be learned, i.e., the subject of the lesson. This could be expressed as the topical area to be covered in that lesson, such as "principles of management," or "techniques of radio repair." To be more useful in lesson planning, however, it should be stated much more definitively. To accomplish this, the lesson subject could be stated as the particular principle, concept, generalization, relationship, skill to be performed, or student behavior to be evidenced at the conclusion of the lesson. For example, the subject could be specified as "the principle that an effective leader sets the example for his subordinates to follow . . . ," or "to determine the cause of malfunction in the IF circuit of an inoperative radio receiver. . . ."

Clearly, the instructor must avoid broad, vague statements of objective that neither limit the scope of the material to be learned nor identify exactly what *is* to be learned. For example, such a broad objective as having each student "understand the development of communist doctrine . . ." is neither limited nor specific enough to provide guidance to either the instructor or to his students. A better (more specific) objective might deal with "the influence of dialectic materialism on the formation of communist doctrine. . . ."

Ideally, each lesson objective should be stated so clearly that there is no possibility for misinterpreting the exact scope of that lesson. A lesson objective which calls for each student to be able to "explain the influence of dialectic materialism on the formation of communist doctrine in a 500 word essay . . ." comes very close to this ideal. If one were to add that the student should be able to complete the task in one hour, given only a pencil and paper, not only would the stated objective be limited and specific, but it would also clearly state a criterion for evaluating student success in learning.

Determine the Level of Learning.

Educational research has identified many different levels and several basic types of learning. For example, psychologists sometimes classify learning as being of the verbal, conceptual, perceptual, motor problem solving, or emotional *type*. Similarly, it has been stated that learning is a building process; that learning any one capability usually depends upon the previous learning of some other, simpler one, i.e., that there is a hierarchy of learning levels.

One way of describing the learning level of a lesson objective would be to take the psychologists' definitions and describe our lesson objectives in terms of the types and levels of learning which appeared to be required. Although this approach might be pedagogically sound, it is not recommended because (1) the entire school faculty would have to be intimately familiar with all the possible types and levels of learning, (2) the possibility of misinterpretation of the intent of such an objective would be high due to lack of agreement among psychologists, and (3) the process of determining objectives would be unduly time consuming.

A second and very popular approach would be to indicate the desired "level" of learning by stating exactly what capability the student should have as the result of a given lesson. This is also a relatively valid approach and has the distinct advantage of providing the instructor with a highly specific teaching goal. Conversely, in practice, this approach can lead to an arbitrary—and sometimes artificial—statement of desired learning. As with programmed instruction, its success hinges on the ability of the instructor to determine exactly what student behavior at the end of the lesson (i.e., terminal behavior) would prove that desired learning had occurred. Although this is an ideal approach when lesson objectives are concerned exclusively with simple motor skills and habit formation, it becomes more burdensome and less effective the closer one comes to lessons involving the learning of complex concepts or generalized attitudes.

A third approach, a compromise between these two, is the approach required for use by resident students of the Academic Instructor Course. This approach tends to be less effective than the terminal behavior method when dealing with simple motor skills because it is less specific. However, it tends to be more effective when dealing with conceptual and attitude learning for essentially the same reason. In this approach, the instructor uses a limited number of defined terms to substitute for a lengthy and involved description of desired student behavior. As previously implied, this approach is particularly useful when the learning objectives involve changes in attitudes, values, insights, or comprehension, although it may also be used to define objectives involving the acquisition of a physical skill. It should be noted that the approach, as further described in the following paragraphs, is academically sound only when all who deal with the resulting statements of objective share a common understanding of the meaning of the short-cut terms. This text discusses four basic "levels of learning".

FAMILIARITY. The phrase "to become familiar with" is used to indicate that each student is to become acquainted with the verbal and symbolic material of the lesson topic. It implies that the learning goal is concerned with initial perception as a natural requisite for more complex learning; it is, therefore, highly suitable for describing the desired learning level of a purely introductory lesson. As a result of learning to this level, most students would be expected to be able to effectively associate important symbols with their correct labels, given one or the other, but not to be able to recite either from memory.

KNOWLEDGE. The phrase "to know" is used to indicate that each student is to acquire factual information in his mind ready for immediate use. At the end of the lesson each student should be able to recall the verbal or symbolic material of the lesson topic. This level of learning, like "familiarity," is a critical part of the learning process and is often the foundation for more extensive learning. It implies that the learning goal is concerned with memorizing or simple habit formation; it necessarily *includes* learning to the familiarity level. As a result of learning to this level, most students would be expected to be able both to identify and to recite or list from memory the important facts, symbols, and simple relationships of the lesson topic, i.e., the students should be able to *tell* "who," "what," and "where."

UNDERSTANDING. The phrase "to understand" is used to indicate that each student is to comprehend a concept or idea. This level may or may not be a prerequisite to all motor skill learning but is clearly a prerequisite to being able to properly apply a concept. At the end of the lesson, each student should be able to *explain* the "hows" and "whys" of the desired concept or skill or perform some comparable task. When working with concepts, prior or concurrent learning to the *familiarity* and *knowledge* levels is obviously required and is, therefore, automatically included in the definition of this level. As a result of learning to the *understanding* level, most students would be expected to be able to differentiate the materials of the given lesson from related materials of other lessons or of their past experience, i.e., they should be able to *compare, contrast,* and *interpret* the material for others. Thus, this learning level goes substantially beyond memorizing or habit formation.

APPLICATION. The phrase "be able to" is used to indicate that each student is to fully master the lesson material. For a physical skill, students would be expected to successfully perform the necessary series of physical acts with little or no supervision. When the subject matter of the lesson deals with concepts, the students should be able to put those concepts to effective use in a real life situation with little or no supervision. As a result of learning to this level, most students would be expected to be able to *analyze* situations, to *synthesize* the material with that to which it is related, and to *solve problems.* On the purely physical skill side of this learning level, each student should be able to *operate, repair, construct,* or accomplish some comparable task.

In addition, whether dealing with physical or mental skills (and regardless of the level with which they are working), many instructors find it helpful to establish some criterion for judging whether the students have gained the desired level of proficiency. Thus, a lesson objective might state ". . . for each student [focus on student] to be able to [level of learning] repair a punctured inner tube [subject] within five minutes given a reparable inner tube and all necessary materials [criterion for judging successful learning] . . . ."

Determine Basic Purpose

The term "purpose," as used in the lesson plan objective, means the reason for the lesson; why the student needs to learn the material contained in the particular lesson.

Once the lesson planner has his purpose firmly in mind, his organization will become clearer, the nature of support material will be more obvious, and the motivation for the lesson will become self-evident. For example, if the student is learning the principles of electrical circuits, the reason why he must learn it (the purpose) becomes important. Is he learning about electricity so that he can wire a house? Or is it to prepare for subsequent material involving the electrical circuitry of an amplifier? Or is it simply as an application of the use of electricity so that he can better understand the theory of electricity? The lesson planner must have a clear purpose for the lesson.

In some cases the purpose is obvious. For example, in the objective "to understand the guided discussion as a method of teaching" the implied purpose is "to become a more effective teacher." In the objective "to understand the effect of environment on learning in order to make teaching more student centered," the purpose is specifically stated and would help the lesson planner by way of guidance for organization, selection of support material, and motivation.

Having considered the separate elements of an objective, the instructor should now be in a position to combine them, as follows:

The objective of this lesson is for each student *(student centered)* to be able to *(level of learning)* fit properly the life vest *(subject)* so that he can survive an aircraft ditching *(purpose)*.

The objective of this lesson is for each student *(student centered)* to be able to *(level of learning)* compute drift angle correction *(subject)* to help him pass his flight check for a civilian pilot's certificate *(purpose)*.

FORMULATING DESIRED LEARNING OUTCOMES

After the instructor has established the lesson objective, he should analyze it to determine the specific learning experiences necessary to achieve it. These are changes in behavior, or desired learning outcomes (DLOs). The DLOs are the student's specific learning experiences that represent a step-by-step development of the lesson toward its objective. The DLOs are the criteria or standards for planning, conducting, and evaluating a lesson. Each one should be stated as a complete thought, relating to a single, specific idea; each should be on a single level of learning and, like the lesson objective itself, stated to express the activity of the student. Each DLO should be formulated carefully and specifically; the instructor can then organize his lesson to help his students achieve these outcomes.

Every statement of a desired learning outcome should meet certain minimum standards. These are discussed below.

Use of Straightforward and Descriptive Language

Preparing definite and precise statements of desired learning outcomes is seldom an easy task. When indicating the level of learning the instructor should avoid such vague wording as "to gain an understanding of," "to understand about," "to understand how," or "to understand why." The word "understand" includes both the "hows" and "whys."

Poor

Each student should—
1. gain an understanding of lesson planning.
2. understand about the nature of learning.
3. understanding how background experience affects learning.
4. understand why we should increase foreign aid.

These vague indefinite statements do not identify the precise ideas to be understood. If these desired learning outcomes are to serve as guides in planning a lesson, they should be stated as clear, specific ideas. If the word "that" is used immediately after the level of learning, the DLO will be forced into specific ideas.

Better

Each student should—
1. understand that lessons must be well planned if the lesson objective is to be achieved.
2. understand that learning is a change in behavior through experience.
3. understand that background experience lays the foundation for future learning.
4. understand that continued support through foreign aid would increase our prestige abroad.

Relationship of DLOs to Lesson Objective

The instructor can frequently develop meaningful DLOs by putting himself in the place of the student and asking questions that would guide the latter's thinking toward the lesson objective. The specific ideas that answer these questions usually constitute the desired learning outcomes. To be adequate, a DLO must stem directly from, and lend support to, the objective. The following example contains an error that inexperienced instructors frequently make.

Objective: The objective of this lesson is for each student to understand three principles of organization to assist him with planning staff responsibilities.

Desired Learning Outcomes: Each student should—
1. understand that unity of command will . . .
2. understand that homogeneous assignment will . . .
3. understand that delegation of authority will . . .
4. understand that good supervision can increase group effectiveness.

The fourth DLO is interesting, and informative, but it does not relate directly to the lesson objective.

Clarity of Meaning of DLO

The phrase "to know the flag," for example, does not convey an unmistakable meaning. It might mean to recognize one's national flag when displayed with other flags, or to describe every feature of a certain flag, or something entirely different from either of these interpretations. Such ambiguous combinations of words are meaningless

DLOs. A DLO worded, "to know that there are 50 stars in our nation's flag," leaves no doubt what the student is expected to know.

Clearly expressed DLOs are especially important for a lesson in which the objective is for the student "to be able to" perform a motor skill. Clarity can be achieved in such DLOs by specifying each subskill that is a part of the overall action or performance. Since the DLOs represent a step-by-step approach to the final objective, it would be inappropriate to state the lesson objective as the final DLO.

Poor

Objective: The objective of this lesson is for each student to be able to wire a male plug correctly.

Desired Learning Outcomes: Each student should—

1. know what equipment is needed.
2. be able to wire the plug.

Better

Objective: The same.

Desired Learning Outcomes: Each student should—

1. know the tools and materials needed to wire the plug.
2. be able to prepare the ends of the wire cord.
3. be able to tie the Underwriter's knot.
4. be able to fasten the wires to the plug correctly.

Once the instructor has established the desired learning outcomes, he has the foundation for his lesson. He knows what he wants the students to gain from the lesson, and he has broken down his lesson objective into separate goals. A good test of the desired learning outcomes is to determine whether each will contribute *directly* to the student's achievement of the overall lesson objective.

RESEARCHING THE TOPIC

After the instructor has established the lesson objective and the desired learning outcomes, he is ready to do research on the lesson topic. Each bit of material that he gathers should directly support one or more of the learning outcomes. To do research on a mass of material and then to develop a DLO to match the findings is the incorrect approach; the DLO should always dictate the support material needed. Research may lead, however, to a decision to modify a DLO for greater accuracy or clarity.

The emphasis which is placed upon each desired learning outcome should be commensurate with the level of learning being represented. The level of learning influences not only the type and amount of support material but also the time required to achieve each desired learning outcome.

Two important criteria for selecting support material are *usefulness* and *appropriateness.* If an instructor selects material on the basis of interest alone, he may prepare a lesson that is full of interesting information but of little value to the student. Conversely, unenlivened, dry facts may defeat the instructor's purpose. When factual material is enriched with interesting information, however, the student is likely to grasp and remember it.

The instructor should weigh every new point he considers. A good test for accepting or rejecting a finding is the question: Will it help the student achieve the desired learning outcome? This simple test enables him to reject extraneous material that he finds during his research.

While doing research, the instructor is likely to find some material that the students should read in preparing for the classroom period. If the instructor keeps this requirement in mind when he begins his research, he can prepare a suggested reading list for the students while he is doing his own research, and this will save him much work later on. For the students' list, he should select interesting, informative background material that deals with fundamentals only.

ORGANIZING THE MATERIAL

After gathering the necessary data, the instructor should organize his material to develop and support the desired learning outcomes. Each main point must relate to the other main points, and together they must support the lesson objective. Each subpoint must add meaning to the main point that it supports.

One of the most effective ways to organize a lesson is to divide it into parts. A frequently recommended division breaks the lesson into an introduction, a development, and a conclusion.

Introduction

The introduction should serve several purposes: to establish common ground between the instructor and his students, to capture and hold the attention of the group, to indicate what is to be covered during the presentation and relate this coverage to the entire course, to point out specific benefits the student can expect from the learning, and to establish a receptive attitude toward the subject and lead into the lesson development. In brief, the introduction sets the stage for learning. For convenience in discussing the necessary elements of any lesson introduction, teachers often speak of three aspects: gaining attention; stimulating motivation; and providing an overview.

ATTENTION. The instructor might begin by telling a story that relates to the subject and establishes a background for developing the learning outcomes. He might gain the students' attention by making an unexpected or surprising statement or by asking a question that helps him relate the lesson topic to the welfare of the group. No matter how the instructor introduces the lesson, his main concern should be to gain the attention of his students and to focus it on the subject.

MOTIVATION. The introduction should offer the students specific reasons for needing to be familiar with, to know, to understand, to apply or to be able to perform whatever they are about to learn. This motivation should appeal to each student personally and accentuate his desire to learn. The appeal may relate the learning to career advancement, financial gain, service to community groups, use at home, or some other attraction, but in every instance a specific application should be cited.

OVERVIEW. For most methods of instruction, the lesson introduction should contain an overview that tells the group what is to be covered during the period. A clear, concise presentation of the objective and the key ideas gives the students a road map of the route to be followed. A good visual aid can help the instructor show the students the route that they are to travel. The introduction should be free of stories, jokes, or incidents that do not help the students focus their attention on the lesson objective. Also, the instructor should avoid a long or apologetic introduction, because it will dampen the students' interest in the lesson.

Development

This is the main part of the lesson. Here the instructor develops the subject matter in a manner that helps his students achieve the desired outcomes.

The instructor must logically organize his material to show the relationships of the main points. He usually shows these primary relationships by developing his main points in one of the following ways: from the past to present, from the simple to the complex, from the known to the unknown, or from the most frequently used to the least frequently used.

FROM PAST TO PRESENT. In this pattern of development, the subject matter is arranged chronologically, from the present to the past or from the past to the present. Such time relationships are most suitable when history is an important consideration, as in tracing the development of tactical air power or nuclear weapons.

FROM SIMPLE TO COMPLEX. This pattern helps the instructor lead the student from simple facts or ideas to an understanding of involved phenomena or concepts. In biology, for example, the student studies the simplest forms of life, then the intermediate forms, and finally the more complex organisms. In studying jet propulsion, the student might begin by considering the action involved in releasing air from a balloon and finish by taking part in a discussion of a complex gas turbine.

FROM KNOWN TO UNKNOWN. By using something the student already knows as the point of departure, the instructor can lead into new ideas and concepts. For example, in developing the theory of flight, the instructor could explain flight in the atmosphere before proceeding to flight in outer space. In this pattern of development, the instructor clearly relates the known to the unknown to achieve student learning.

FROM MOST FREQUENTLY USED TO LEAST FREQUENTLY USED. In some subjects, certain information or concepts are common to all who use the material. This fourth organizational pattern starts with common usages before progressing to the rarer ones. In a course on navigational proficiency, pilots start by learning dead reckoning procedures, which become the basis for their study of other forms of navigation, such as radio, loran, shoran, and consol.

Under each main point in a lesson plan, the subordinate points should lead naturally from one to the other. With this arrangement, each point leads logically into, and serves as a reminder of, the next. Meaningful transitions from one main point to another keep the students oriented, aware of where they have been and where they are going.

Organizing a lesson so that the students will grasp the logical relationships of ideas is not an easy or quick task. But this type of organization is necessary if students are to learn. Poorly organized information is of little or no value to the student.

Conclusion

The conclusion of any lesson should accomplish three things: summation, remotivation, and closure. The effective summary retraces the important elements of the lesson and relates them to the objective. This review and wrap-up of ideas reinforces the student's learning and helps him retain what he has learned. No new ideas should be introduced in the conclusion, because at this point they are likely to confuse the students. The purpose of the remotivation is to instill in the students a desire to retain and make use of what they have just learned. The closure may consist of a quotation, some concise statement, or any other device that will leave no doubt that the lesson is completed without detracting from the student's motivation.

SELECTING INSTRUCTIONAL METHODS

In planning a lesson, the instructor should consider what the students already know. He must be familiar with the background and experience of his students to carry them from where they are in his subject matter area to where he wants them to go. If he ignores their background knowledge, they will find him a condescending bore. On the other hand, if he assumes that his students know more than they actually do, they will be lost from the beginning of the lesson. The students' actual knowledge of the subject should dictate the complexity of the material to be covered and the approach to be followed.

Since each lesson is usually only one element in a course covering many subjects, the instructor should develop each lesson objective so that it supports the objectives of related lessons in the curriculum. One way for him to insure this integration is to discuss his lesson plans with fellow instructors: show them a tentative lesson outline, ask for their reactions, and if possible arrange for them to attend and critique a practice session. Their comments are likely to contain many useful suggestions for making the lesson more effective.

After deciding exactly what to teach in a lesson, the instructor determines how best to teach it or what instructional method to use. This selection of method is an *integral part of lesson* planning.

When related to instruction, the word "method" refers to a planned sequence of procedures used to help students reach a desired learning outcome. An instructional method may include the use of any devices, techniques, or procedures that will help students acquire additional learning. To put it another way, an instructional method is a combination of techniques that a teacher uses to enable students to participate in activities offering meaningful experiences. A method is a broad approach to instruction; for example, the lecture method or the discussion method. A technique, on the other hand, is a specific concrete act or procedure used in implementing a method; for example, the technique of using the chalkboard or of telling a story.

Philosophy Underlying Selection

Knowledge does not exist in and of itself—it has to be discovered. Knowledge is continually being recorded from the observations and experiences of people. Knowledge, then, comes from experience. Since people acquire knowledge through their own experiences or those of other people, the most effective learning results from vivid experiences. It follows that the best teaching method is the method that provides the most vivid experiences for the learner.

A teacher should think not in terms of his activities as a teacher, but in terms of the student's activities as a learner. After the teacher has established a lesson objective, he must decide how he will direct student activities toward the attainment of the desired learning outcomes. In making this decision, the instructor considers the ways that people learn: by doing, by discussing, by listening, by observing, and by participating. He selects the instructional method that will most effectively guide the students toward the desired learning outcomes. In other words, *the learning outcomes dictate the method that will provide the learning experiences needed by the students.* The teacher's role, therefore, is to provide the activities that will result in meaningful experiences for his students.

The Selection Process

No one method is suitable for all teaching situations because no single method is flexible enough to meet all the needs of students in every learning situation. As mentioned above, the nature of a desired learning outcome suggests the type of activity that will be most helpful to the students in achieving that outcome. If, for example, the students are to gain skill in performing a certain task, one of their activities should be practice in performing the task. If the desired outcome is knowledge, the student probably should watch and listen so that he can relate what he hears to his own experience. If the desired outcome is for the student to be able to apply a principle, he might be asked to solve a problem or perform some task requiring an application of that principle.

To proceed with the lesson-planning process, the nature of the student activity should indicate to the instructor the method that he should use to stimulate and guide his students. The instructor can, for example, guide a student discussion by asking questions. Similarly, if the students are to learn to apply a certain principle in solving problems, the instructor must provide problems requiring the application of that principle.

The instructional approach that the teacher chooses for one learning outcome may be different from the approaches he chooses for other outcomes in the same lesson. In fact, he may select a different instructional method for every desired learning outcome in his lesson plan by planning and selecting the approach he believes to be most appropriate for helping his students achieve each learning outcome.

Factors Limiting Selection

Certain limiting factors may prevent an instructor from using the instructional activities that he prefers. In addition to the desired outcome, the instructor must consider the background and ability of the students, the number of students, his own personality, the time allotted to the lesson, and the available facilities.

These and similar factors are limiting, but not determining, factors. For example, the instructor might see that a problem approach would be most effective for a certain desired outcome, yet recognize his students' lack of background and experience for solving the complex type of problem that would be required. For that reason, he might substitute an adaptation of the case method to approximate the desired outcome. Some possible ways of doing this would be to (1) have a panel of experts discuss and solve the problem, (2) present the problem and its solution in a handout for the students to read and study, or (3) describe the problem and its solution as a means of stimulating student discussion of the principles involved. Many other approaches can be based on the use of problems to teach.

The number of students and the facilities available must be considered during lesson planning. For example, a certain desired outcome might suggest discussion as the most appropriate method, but the class might be too large for an across-the-board discussion to be effective. When the facilities are inadequate for dividing a large class into small discussion groups, the guided-discussion method is usually ineffective. A dialogue, a panel, or a symposium might, however, quite effectively achieve the desired outcome. The socialized recitation method of asking questions and getting responses from some or all of the students is also effective for a large group that cannot be divided.

The instructor might use any of these methods to encourage the students to volunteer explanatory and supporting matter from their personal experiences, opinions, and beliefs. From these contributions, he could then develop the same principles or ideas that he could teach to a smaller group through discussion. When these and similar techniques are combined with a lecture, the students are usually stimulated to do more thinking than when only the lecture method is used. See Table 1.

Chapters 16 through 20 explain basic methods of instruction. The instructor who masters all these methods can combine, adapt, and modify them to meet his own needs and those of his students.

PREPARING THE LESSON PLAN

The written lesson plan has been carefully designed to serve several purposes. It is a checklist to insure that the very best planning has gone into the lesson. It is a teaching guide during the lesson, and it can serve as a reference for another instructor who may have to conduct the lesson in an emergency. It is a handy record of how the lesson was planned and is to be accomplished. One of the most practical functions of the lesson plan is to serve as a step-by-step guide for the instructor while he is planning the lesson. To insure the best learning situation for the student and to assist the instructor in outlining his lesson for easy presentation, these steps should be followed.

Part I of the lesson plan is an overview of the lesson objective, desired learning outcomes, references, and related general information. Part II contains a complete outline of the lesson development. The ideas discussed earlier in this chapter relate to collecting and organizing material for the lesson but the medium used to fuse these ideas together, to give structure to these ideas, is the lesson plan itself. Each step in the process depends upon the step that precedes it. First, the instructor clearly establishes the Lesson Objective. Next, this Lesson Objective is broken down into its component parts called Desired Learning Outcomes. Finally, each of these DLOs is developed in a step-by-step process starting with student outcomes, student activity, and finally instructor activity. If the instructor follows this logical sequence, the lesson plan serves as a format which lays out each succeeding step in accordance with sound teaching psychology.

The format of the lesson plan shown in succeeding chapters was developed to insure student-centered thinking during the planning process. The concept of active student participation as a basic principle of effective learning is a significant part of the planning sequence.

TABLE 1

	NATURE OF REQUIRED LEARNING	REQUIRED LEARNER ACTIVITY	APPROPRIATE INSTRUCTOR ACTIVITIES	POSSIBLE INSTRUCTOR APPROACH
APPLICATION	Ability to solve, synthesize, repair, construct, create, operate or analyze (plus intermediate behavior listed below).	*Development of generalizations* and reinforcement of concepts through practice in solving problems or performing skills — in addition to practice in recalling facts and symbols and in comparing and contrasting concepts.	*Provide students with a learning environment in which they can try to solve appropriate problems or perform appropriate skills; supervise student activity and reinforce appropriate behavior* — in addition to explaining, demonstrating, or causing students to discover the "who," "what," "when," "where," "how," and "why" of the subject.	Case study, problem discussion, guided discussion, assignment, laboratory, evaluation, supervised performance, programmed instruction, etc.
UNDERSTANDING	Ability to contrast, compare, differentiate, interpret, or explain how and why (plus intermediate behavior listed below).	*Development of desired concepts* and reinforcement of relationships through practice in recalling facts and symbols and comparing and contrasting related concepts.	*Explain, demonstrate, or cause students to discover the "hows," and "whys" of the desired concept or skill* — in addition to the "whos," "whats," and "wheres."	Reading assignment, explanation-demonstration, panel, lecture, teaching interview, programmed instruction, laboratory, discussion, symposium, evaluation, etc.
KNOWLEDGE	Ability to identify, list, or recite, who, what, and where from memory.	*Preception of facts related to symbols* through practice in recalling facts and relating them to appropriate symbols.	*Explain or demonstrate "who," "what," and "where" of the subject* — in addition to showing, illustrating, or providing opportunity for limited involvement through observation.	Reading assignment, introductory film, briefing, panel, explanation-demonstration, lecture, teaching interview, programmed instruction, socialized recitation, etc.
FAMILIARITY	Ability to associate symbol with label; given one or the other.	*Initial perception of symbols* through use of one or more senses.	*Show or illustrate subject to students* — or provide an opportunity for observation.	Reading assignment, introductory film, briefing, panel, demonstration, etc.

SUMMARY

The first step in planning a lesson is to define and state the lesson objective and the desired learning outcomes. The objective should be limited to a feasible outcome, and the objective and outcome should both be stated in terms of student activity. The desired learning outcomes should be stated clearly and concisely to reflect what the student is to retain from the learning experience.

In planning a lesson, the instructor usually needs to do considerable research. The lesson objective and the desired learning outcomes guide him in this research, the extent of which depends largely on the available time, the instructor's past experience with the subject matter, and the complexity of the subject.

As the instructor gathers his research material in support of the desired learning outcomes, he organizes it to some extent. The primary emphasis in the final organization of the material should be on the clear and logical arrangement of ideas and procedures. Main points should overshadow subordinate points, and the material should be closely related and arranged so that one idea or procedure leads naturally to the next. This type of organization helps the student remember important points, because each key fact serves as a reminder of related facts.

The final selection of an instructional method may very well be a compromise between the method that is most suitable to the outcome (an ideal approach) and the method that is possible under the circumstances (a realistic approach). Many variations, combinations, and adaptations can be made of any method or methods of teaching; in fact, the number of possibilities is limited only by the instructor's imagination. For this reason, the instructor should recognize the many available opportunities to help his students accomplish desired outcomes.

The primary purpose of the lesson plan is to insure that the instructor considers every factor that might influence the effectiveness of a lesson as he plans that lesson. The lesson plan also helps him keep a constant check on the activities he plans for himself as well as those he plans for the students. This careful preparation helps him guide his students toward the desired learning outcomes when he presents the lesson he has planned.

CHAPTER 4

The Teaching Interview

Conversation forms a part of our daily lives. Conversation occurs when two or more people exchange information or present viewpoints. Interviews are special types of controlled conversation aimed at specific goals. Interviews vary broadly in content according to their purpose or the situation in which they are conducted. For example, interviews are used in conjunction with personnel practices which include assignment of personnel, appraisal of performance, retention and separation; or in management situations for giving orders, handling complaints, reprimands, and dismissals. Interviews are also used in sales work, in counseling, for information-getting purposes, including polls and surveys, and for such specialized purposes as medical diagnosis, criminal investigation, and legal inquiry. The teaching interview is simply another type of interview used for learning purposes.

BACKGROUND

In one sense, the interview as an educational technique was born when the first student asked the first question and the first teacher replied. The interview was not formalized, however, until Socrates instituted teacher-to-pupil dialogue to replace the one-sided lecturing approach of the Sophists. This Socratic dialogue relies on the premise that each man has a reservoir of intuitive knowledge which can be discovered through questioning techniques. The student is a participant in this dialogue, and he learns by relating what he knows to what he does not know. This dialogue technique is still used to discover principles of management, leadership, and group dynamics; in addition, it is the basis of most conferences and discussion methods of learning.

The teaching interview as an educational technique has the Socratic dialogue as its source. It is basically a dialogue which pairs a skilled instructor with a recognized expert in a classroom situation. The interview used for learning purposes becomes a planned learning activity between two people when one person has specialized knowledge of a subject or is an expert in a particular field and another person attempts to draw out specialized knowledge by means of questions. Essentially the interview is an effort to efficiently use persons with special qualifications and experiences to satisfy planned learning outcomes for students. It becomes the job of the instructor to elicit the right responses from the expert. The students then learn by actively observing the interview.

USES OF THE TEACHING INTERVIEW

The teaching interview as an instructional method provides the instructor with a valuable means of achieving planned learning outcomes. Several specific uses of the technique may be singled out for attention.

The teaching interview may be used to supplement the instructor's knowledge of a specific subject area. When the subject matter is very broad, an outside resource person may be used to cover a "knowledge gap." For example, management courses could easily profit from the interview of an expert who has had experience in conference leadership. In educational fields, experts who have worked with "exceptional" children could contribute significantly to an understanding of the learning process. Public schools have benefited frequently by bringing in firemen, policemen, and other local specialists and interviewing them for students.

Another use of the teaching interview is enrichment of the curriculum. The appearance of an expert or authority tends to lend an air of credibility to a classroom that is seldom duplicated by the average teacher. The teaching interview lesson may also be used to introduce variety into the curriculum. For example, if the instructor usually lectures, he can achieve a change of pace by scheduling a teaching interview lesson. This change in technique can help avoid the monotony of form which inhibits learning.

The teaching interview can also be a motivational device. It can be used to introduce a block of instruction and gain the students' interest. For example, a physician could introduce a series of lessons on first aid. A recent returnee from Vietnam could introduce a section of instruction dealing with counterinsurgency.

The teaching interview can also be used as a problem solving activity. The instructor can interview an expert in a particular area, presenting a problem to the expert for solution. The course of the interview, then, can present the solution to the problem.

PLANNING THE TEACHING INTERVIEW

The instructor must examine the curriculum closely to determine the need for interview lessons. Some areas lend themselves better to teaching interviews than others. The interview lesson is best suited for exploring attitudes, experiences, and opinions, rather than conveying factual knowledge. The instructor must also make a value judgment about the resource person's contribution to the overall curriculum. He must insure that the prospective expert will make an integral contribution to the overall learning experience. He must also insure that the expert's appearance will mesh with total curriculum objectives.

Once the instructor has established a curricular need for the teaching interview, he must plan the goals of the interview. He must remember that an interview can delve into an expert's reasoning process and examine the rationale for arriving at conclusions. The interview probes the "whys" and "hows" of a thinking mind and brings to the surface the philosophical underpinnings of an expert's attitudes and opinions. The interview lesson discusses "the importance of . . .," "the value of . . .," and "the reasons for . . ." particular events or actions, rather than the events or actions themselves. These valuable additions to the learning process, then, influence the statement of the objectives of the lesson.

After the instructor has stated the objectives of the lesson, he must select the expert to be interviewed. Just as the first step in any sort of research is to explore one's own resources, so the first step in selecting an expert is to examine one's own faculty or colleagues. The best available resource may be in the next office. Barring that, the average military installation, the local community, or a nearby college hold the potential for providing experts for interview lessons.

The instructor does well to select a recognized expert, if one is available. Students are impressed by prominent personages and accept their remarks readily. In addition, students are impressed by academic degrees. The instructor, then, can save time in developing support material for the expert's ideas, because the students will accept the expert's testimony at face value. Inexplicably, an expert's mere presence in a classroom commands an aura of credibility.

Naturally, the instructor realizes that simply because a man is an expert in one field, he is not an expert in all fields. An expert is, after all, one who has a specific knowledge of a subject and who is an authority in a particular field. An expert in political science is therefore not necessarily an expert in education.

Once the instructor has selected an expert and established his expertise, he should find out as much as he can about the man and his works. The instructor should ascertain if the expert can provide clear, accurate, and definite pieces of data. He should also determine if the expert can set forth his views with candor and frankness and explain clearly the basis for his opinions. If the instructor discovers that the "expert" really is not an expert or that the expert presents a negative personality which might be a barrier to learning, he should locate another expert.

The instructor should also spend time researching the subject area that the interview lesson will cover. He must also look into the background of the expert. If the expert has published works or made public statements, the instructor should examine these to gain insight into his views. If the instructor has a thorough grasp of the expert's opinions and viewpoints, he can pick and choose those ideas of the expert which will be of the greatest value to the students. In addition, the instructor is in a better position to probe and explore ideas which he has examined closely.

The instructor then must narrow his research to the subject of the interview itself: what is to be the desired content of the interview? what sorts of questions will prompt the best answers? how should the interviewer react to the responses of the expert? Obviously, the instructor does not need to know the subject of the interview as well as the expert. If the instructor does know a great deal about the subject, the interview may become too detailed for the students to follow. In addition, the instructor who knows the subject of the interview exceptionally well may interject his own views into the interview, rather than center attention on the views of the expert.

The instructor's last step in the preliminary planning of the teaching interview is the preparation of a topical organizational outline of the lesson in logical sequence. This topical outline must correlate closely with the lesson's desired learning outcomes. The instructor must consider how the expert's knowledge can best be exploited to satisfy overall lesson objectives. As the instructor prepares this topical outline, he will probably discover that some limitation of the subject, as well as the lesson objective, is necessary. As he considers the time allotted for the lesson, the depth of detail, and the degree of understanding desired, he will probably find that he should limit the scope of the interview. In general, a teaching interview can cover fewer facts and ideas than a lecture.

The topical outline will also suggest question areas to the instructor. He can place himself in the position of the student and decide what does he need to know in order to increase his understanding of the expert's attitude or experience. However, the instructor should not write out specific questions for the interview at this point; rather, he should establish in his own mind the general areas of questions to be covered. The next logical step in arranging for the teaching interview pairs the instructor and the expert in a coordination meeting.

COORDINATION

Three major coordinating steps precede the actual teaching interview lesson. Two of these steps involve meetings between instructor and expert, while the third step deals with the students themselves.

Preview the Subject with the Expert

The first coordinating step is a meeting between the instructor and the expert. The aim of this meeting should be the previewing of the subject of the interview. During this meeting, the essential facts and the specific topics or subject areas to be covered can be discussed. A general common outline of the lesson may be prepared which may serve as a tentative guide for the interview itself.

Most importantly, perhaps, the expert can gain a better appreciation of which areas of subject content are to be covered. He may wish to add or delete items that either he does not feel qualified to discuss or that he may wish to avoid in public discussion. He may insure that the interview will not include any embarrassing situations and that a feeling of mutual trust will exist between him and the instructor. The instructor must remember that an interview lesson is not an interrogation in which he can badger the expert into an admission of guilt and error, nor is the interview lesson an opportunity to make the expert appear foolish, ignorant, or emotionally upset.

This mutual consideration will lead to good rapport between instructor and expert. Good rapport between these two is essential to the successful outcome of the interview lesson. If the instructor cannot arrange a face-to-face meeting, he can settle some subject content by correspondence or by telephone. Building rapport and establishing a good working relationship will have to wait until shortly before the lesson begins.

Announce the Visitor's Appearance to the Class

The second coordinating step involves the students themselves. The instructor should distribute a short biographical sketch of the expert to the students along with a brief outline of the lesson to be presented. This material will help arouse student interest and curiosity, and it can serve as motivation, as well. Students may become more involved if the instructor asks them for questions to be used during the interview. Knowing who is coming, what his qualifications are, what he will be interviewed about, and what questions students would like asked help make the expert's appearance an integral part of the curriculum.

Meet with the Expert

The final coordinating step is a short meeting between expert and instructor shortly before the actual interview presentation. This final meeting gives the expert a chance to become physically adjusted to the interview situation—to see the classroom and its equipment. This meeting also helps develop informality and cordiality, particularly important if the expert is meeting the instructor for the first time. Chit-chat, easy questions, and a few humorous remarks can help set the expert at ease and establish the relaxed and permissive atmosphere of the interview lesson. In addition, last minute changes in the interview outline can be made, and opening and closing signals for the interview can be selected.

THE INTERVIEW LESSON

The interview lesson is not a series of short speeches, nor is it solely a question and answer period. Rather, the teaching interview is a conversation between two people in a classroom situation, used as a teaching method. The instructor must bear this in mind when he is actually conducting an interview lesson.

It is helpful if the expert has had an opportunity to become physically oriented to the room, the lighting, and the students before the actual interview. If he has not had this opportunity, the instructor must allow extra time for his adjustment to the physical situation before the interview proceeds too far. If possible, the instructor should arrange a "warm-up" session in private with the expert, just before the interview lesson. If this is not possible, the instructor should begin the interview with easily answered questions which are geared toward opening up the subject and the person, such as "How did you become interested in your field?" and "What are you working on now?" Engaging in social pleasantries here is not essential; rather, this preliminary conversation should clearly establish the purpose of the interview.

Introducing the Interview

Like any other well organized lesson, the introduction of the interview lesson focuses attention on the subject, prepares students to recognize the value of listening, and provides them with an outline of how the interview will progress. The instructor does not have to present these three steps (attention, motivation, and overview) in order; rather, he should emphasize the purpose of each of these three steps to the students. Normally, students will be aware of an expert's appearance, and they will also be aware of the integral importance of the subject under consideration to the curriculum. Similarly, the lesson outline or introduction confirm for the expert the approach which instructor and expert have previously agreed upon.

Asking Questions

The development section of the interview lesson centers on the conversation between the instructor and the expert. The instructor's task is to draw out the expert by serving as a stimulus to conversation. He asks questions which bring out ideas in support of desired learning outcomes. The instructor has planned the lesson so that it will develop along certain lines to satisfy specified learning outcomes; hence, the lesson is semi-structured.

The instructor in this semi-structured lesson acts as more than a non-directive counselor but he does use non-directive counseling techniques. He must insure that he does not become so directive that conversation is stifled. He controls the interview situation at all times, even to the extent of interrupting the expert, if encessary. In brief, the instructor's role in an interview lesson is more that of a manager than that of a typical leader. His demeanor should be natural, friendly, permissive, and conversational. He must at all times be genuinely interested in both the guest and the subject. He must listen to what is being said, and he must be prepared to ask for further clarification, examples, details, and other support material if required or to pursue new lines of discussion when necessary.

The instructor, then, bridges the gap between the expert and the students. The instructor interprets what the expert says and provides one of the interview's distinguishing characteristics, immediacy of feedback. The instructor is the best judge of students' needs and also of how well the information given in the interview is satisfying those needs.

The questions themselves are the vehicle for satisfying the students' needs, in addition to satisfying the learning outcomes of the lesson. The successful instructor organizes his questions in a definite sequence relating to the subject's central theme and the lesson objective. Questioning sequences may follow any acceptable organizational pattern (chronological, logical, topical, etc.) so long as that pattern is apparent to the students.

Each question should be clear and definite for both the expert and the students. The expert should not have to guess about what the question means, what it implies, or what kind of answer he should give. If the expert seems to be having difficulty with a question, the instructor should restate it, rather than merely rephrase it. Questions which are lengthy, involved, and ambiguous do not always help the expert give the best possible response. Questions which are simple, precise, and direct are better for telling the expert just what is expected. Questions which contain unfamiliar or technical vocabulary may be misunderstood by the students or, for that matter, by the expert; hence, such questions should be avoided.

The instructor should also insure that the response to a question is within attainable limits for the expert. More profitable discourse results when the expert knows that he can supply reasonably complete answers; similarly, more learning results when realistic and honest approaches are made to a subject. The instructor can determine what sorts of questions will produce the best results in his planning sessions with the expert.

It is all too easy to make an exaggerated appraisal of an expert's knowledge or of the amount of information he possesses on a particular subject. The instructor can make certain that the questions asked will be within the realm of expertise of the expert.

The instructor must remember that questions direct attention to ideas and elicit comments and explanations which clarify ideas in depth. Some questions perform these tasks better than others. Questions which are phrased openly, which cannot be answered with a simple "yes" or "no," are better for provoking discussion. Questions which begin with *is, do, has, can, will,* and *shall* most frequently can be answered with a simple "yes" or "no." With an outgoing, talkative expert, the instructor does not have a problem of keeping the conversation moving. However, with a reticent, taciturn expert, the instructor must insure that the questions will prompt more elaborate responses than agreement or disagreement. Examples of questions which will open up conversation include: "What are your ideas concerning . . . ?," "What is your opinion about . . . ?," "Why do you feel . . . ?," and "How do you view . . . ?"

The instructor must also remember continually that the interview is for the student's benefit. He must therefore assess the expert's responses on the basis of student understanding and follow up on replies as necessary when the replies are vague, confusing, or incomplete. Follow-up questions such as "Can you illustrate the point further?," "Under what circumstances would that apply?," or "What is the basis for your opinion?" are useful for clarification.

The instructor may also guide the conversation by repeating phrases which the expert has already used. This technique invariably causes the expert to expand his ideas further. Nodding to answers reassures the expert and gives support to his comments. Semi-verbal expressions such as "umm" which may be interpreted as the expert wishes encourage him to continue. Certain neutral questions may also be used to obtain a fuller, clearer response. Examples of neutral questions include: "How do you mean?," "What do you have in mind there?," "Why do you feel that way?," and "Why do you think that is so?"

The instructor does well *not* to give the expert the actual wording of the questions before the interview begins. Instead, he should let the expert know the general areas to be covered and the general types of questions to be asked. Then, when the interview is in progress, the expert's answers to questions will be genuinely spontaneous. The instructor should also plan adequate time for the expert to reflect upon the question, to decide upon an answer, and to word a reply. The short gaps in the conversation which these pauses will create are not harmful to either the expert or the students. Actually, they will give the expert a chance to gather his thoughts together and give a more complete response than if a follow-up question is asked too quickly.

Ending the Interview

The instructor's role in the concluding section of the teaching interview is most important. He summarizes the main ideas presented by the expert, or he asks the expert to summarize the main ideas himself. He then thanks the expert for his contribution to the student's understanding. Finally, he remotivates the students and establishes closure.

SUMMARY

The teaching interview method of instruction is essentially a tool by which resource persons and experts can more effectively contribute to learning. This method gives the instructor an opportunity to be more flexible in his instructional practices and still satisfy planned learning outcomes. The degrees of success in the use of the teaching interview rests with the consideration of certain fundamental issues. The successful interviewer needs to plan his lesson carefully, conduct his lesson with rapport, and guide the expert's responses through probing, inquiring, suggestive questioning techniques. This knowledge of the theoretical aspects of the methodology involved, coupled with practical opportunities for application, will result in more productive teaching.

SAMPLE LESSON PLAN

ACADEMIC INSTRUCTOR COURSE
Academic Instructor & Allied Officer School
Air University
United States Air Force
Maxwell Air Force Base, Alabama
TITLE: The Code of Conduct
CODE: AIC-420b
INSTRUCTOR:
ADVISOR:

PART I - OVERVIEW

LESSON OBJECTIVE: The objective of this lesson is for each student to understand some of the reasons for the establishment of the Code of Conduct in order to fulfill his obligations as a uniformed service member.

DESIRED LEARNING OUTCOMES: Each student should

1. be familiar with the circumstances which lead to the adoption of the Code of Conduct.
2. understand that the need for a "Code of Conduct" grew out of the high incidence of death and collaboration of American POWs in Korea.
3. understand that the Code of Conduct fulfills a definite need for the American fighting man.

INSTRUCTOR REFERENCES:

1. Dept of Defense, Office of Armed Forces Information and Education. *The U. S. Fighting Man's Code.* Washington, U.S. Govt Print Off., 1955. 94p.
2. Dept of Defense, Defense Advisory Committee on Prisoners of War. *POW, the Fight Continues After the Battle.* The report of the Secretary of Defense's Advisory Committee on Prisoners of War. Washington, U.S. Govt Print. Off., 1955. 82p.
3. Garnett, Arthur C. *The Moral Nature of Man: a Critical Evaluation of Ethical Principles.* New York, Ronald Press, 1952. 279p.
4. Twenty-one American GI's Who Chose Communism (excerpts from the book "Twenty-one Stayed," by Virginia S. Pasley) *U.S. News & World Report 39:* 40-44+ Jul 15 '55.

INSTRUCTIONAL AIDS: Flip chart, Chalkboard

STUDENT PREPARATION: Read AFP 34-10-1 U.S. Fighting Man's Code, 6 Aug 1959.

HANDOUT MATERIALS: None

TIME REQUIRED: 35 minutes

PLAN OF PRESENTATION: The instructor will introduce the lesson subject and motivate the students by pointing out their responsibility to know, use, and explain the Code of Conduct. He will introduce the expert to the class and the class to the expert. The background and special qualifications of the guest will be established. The instructor will narrow the subject to three aspects and overview the lesson. He will question the expert in order to develop the DLOs, asking follow-up questions as required. Transitions, and summaries will be made as needed. The instructor allows for student questions if time permits. He will conclude the lesson by briefly summarizing (or calling upon the expert to summarize) the main points of the lesson which achieved the lesson objective. He will briefly remotivate the group, thank the expert and close the lesson.

PART II

STUDENT OUTCOMES	STUDENT ACTIVITY	INSTRUCTOR ACTIVITY
	A. INTRODUCTION (3-4 min)	
1. Gives attention to instructor and student.	1. Listens, mentally responds to question and subject area.	1. Gains attention of Class by asking "In Every War but One," What does that mean to you? Establishes relationship to lesson subject, pointing out experience of Korea indicated a need for a Code of Conduct.
2. Accepts the expert as an authority. Becomes identified with the subject.	2. Mentally evaluates expert's qualifications.	2. Introduces expert and explores his background and qualifications through discussion. Introduces students to expert, describes their experience level and broad knowledge of subject.

PART II—Continued

STUDENT OUTCOMES	STUDENT ACTIVITY	INSTRUCTOR ACTIVITY
	A. INTRODUCTION (continued)	
3. Establishes interest and personal desire to know more about the subject.	3. Realizes the personal need to know more about the Code of Conduct.	3. Motivates students by establishing their a. responsibility to know the "Code" as military members. b. obligations to their subordinates to explain the Code. c. need to know as American citizens why the "Code" was implemented.
4. Recognizes the lesson objective is to understand some of the reasons for the establishment of a Code of Conduct.	4. Identifies mentally the areas to be covered.	4. Presents the lesson objective and specific areas to be covered: a. Immediate reasons for formulating a Code of Conduct. b. The experiences of Korea which established a need for a Code. c. What the Code is designed to accomplish.
	B. DEVELOPMENT (24-26 min)	
1. Becomes familiar with the immediate reasons for adopting a Code of Conduct.	1. Mentally engages in discussion. Relates responses of expert to his own knowledge or experiences he has read about.	1. Presents question to the expert: What were the immediate circumstances that prompted the adoption of the Code of Conduct? If needed, follows up with: Why didn't name, rank and serial number suffice in Korea? or, what bearing did the 21 defectors have upon public opinion? Summarizes and provides transition to next idea.
2. Understands that the need for a Code grew out of the Korean experience of American POW's.	2. Relates comments of expert to previous conception of causes of death and collaboration. Recalls movies where these ideas were portrayed; remembers statistical presentation he has seen. Grasps the concept that a standard of conduct was essential.	2. Presents question to expert: Why did so many American prisoners of war die in captivity? Follows up with why was there such a high incident of collaboration among the prisoners? Could this have been prevented? What was the experience of other involved nations?
3. Understands that the Code of Conduct fulfills a definite need.	3. Recognizes that if he or others were placed in a combat or captive situation that a code would be needed.	3. Presents questions to expert: In your opinion, why was the Code of Conduct written? Follows up with: In what ways does it aid the serviceman? How can it help him if captured?
4. Reinforces preceding DLOs. Clarifies unresolved issues.	4. Asks question to clarify understanding of subject.	4. Briefly summarize.
		5. Asks if there are any questions of a general nature if time permits.

STUDENT OUTCOMES	STUDENT ACTIVITY	INSTRUCTOR ACTIVITY
	C. CONCLUSION (4-5 min)	
1. Recalls the main points of lesson as they relate to achieving the lesson objective.	1. Mentally reviews main points and establishes a relationship between ideas presented and the lesson objective.	1. Summarizes or has expert summarize main ideas presented in each DLO.
2. Appreciates expert's contribution to lesson.	2. Listens.	2. Thanks expert for his appearance and contribution.
3. Recognizes the value of the lesson and is motivated to retain and apply what he's learned.	3. Gives attention and becomes stimulated to use his grasp of the subject.	3. Remotivates students by explaining how an understanding of the experience of Korea which lead to an adoption of a Code of Conduct will help them better employ the Code if called upon or explain it more clearly as required.
4. Realizes the lesson is concluded.	4. Listens	4. Establishes closure by stating: Let us insure that "In every war but one" never becomes "In every war but two."

ACADEMIC INSTRUCTOR COURSE
Maxwell Air Force Base, Alabama

AIC-432 3-7

THE USE OF THE CASE STUDY IN AIR FORCE TEACHING

The following comments and suggestions, while general in nature, represent the thinking of a number of writers and authorities in the use of the Case Study Method for the instructor, primarily. No attempt has been made to be all inclusive; rather a listing of selected "do's" and don't's" is presented for study before and use during a case discussion.

Your Point of View

1. "You must create a classroom environment that will enable the group to actively discuss the case."

2. "You must learn to accept individual differences among students and their opinions."

3. "Be yourself. The introduction of forced, unnatural showmanship may disrupt the easy informal atmosphere that is most conducive to productive thinking. Sincerity is far more desirable than theatrics or any form of artificial stimulation."

4. "Make a sincere and obvious attempt to understand each student and his comments. The chances are good that such an attitude will be contagious and cause students to become interested in the comments of others."

5. "You should cultivate an instructor-student relationship which is based on mutual respect. You can do this by setting the example -- demonstrating a consideration for the rights and feelings of others."

6. "Always remember that case method discussions are student-centered."

7. "Generally there is usually no right answer for many situations. It is more important to engage in a good exercise of decision-making than in an endless search for one right answer."

8. "Active discussions thrive best in an informal atmosphere."

9. "Know the case better than your students. Prepare! Prepare! Prepare!"

10. "You must be capable of distinguishing between fact and opinion."

11. "There is no 'school solution' to a case. Don't indicate or suggest anything which indicates a 'cut and dried' approach."

Your Role as Case Leader

1. "There is no best way to introduce or conduct a case discussion. There are many ways to open the discussion. Some case leaders start with the question, 'What is the issue?' and from there go on to, 'What are the pertinent facts?' Others start with, 'What are the facts?' Others begin by asking, 'What action should be taken?' Still others ask, 'What about this case?' One of the best classes simply opened by the instructor asking, 'Mr. X, will you begin?'"

2. "Refrain from lecturing. If you lecture during a class period, you will lose the class. Remember that preaching is not teaching -- in the case method, that is. The case method 'stretches the mind'; it does not 'train the brain.'"

3. "The case leader must be a good listener and must be able to interpret the meaning of individual comments."

4. "The good case leader must not enforce his will upon students."

5. "Do not argue. Do not give advice. Do not take sides. Do not direct the discussion. Do not make moral judgments."

6. "Try to grasp why certain group members do not participate."

7. "Tactfully attempt to get the non-participating members into the discussion."

8. "Remember that no two group members perceive the case or the facts in it in quite the same way. The group members need to learn this as well."

9. "Both the instructor and the class must learn that the most verbose students are not necessarily those who best understand what is fundamental in a case."

10. "The case leader guides the group towards a solution."

11. "The student usually learns quickly that there is much he doesn't know and that short cut solutions and theoretical shadow boxing will not clarify issues or unravel real problems."

12. "Three things the instructor can do to promote the productivity of the discussion:

    a. "Ask questions. (Remember that questions can be overused. A good case discussion is not a series of questions asked by the instructor and answered by the students.)"

    b. "Restate and re-thread what is said."

    c. "Draw upon his knowledge of the facts when students are in need of additional facts."

13. "If the discussion is going along at a rapid pace and with many thoughts being incompletely thought out and expressed poorly, the leader can slow the group down by frequently rephrasing what has been said and then question for depth."

14. "Periodic summaries of the class discussion will aid progress toward a solution."

15. "Contributions of ideas by the case leader should be made only after the group has reached the farthest destination of which it is capable."

16. "Even though the case leader lets the group carry the ball at the outset, he can help sharpen agreement on major issues and permit that discussion which aids such agreement."

17. "From time to time class interest needs to be built or sustained. A change of pace is often helpful. The case leader can modify his questioning, illustrate from his experience, or turn to a new aspect."

18. "The case leader will find that from time to time he will need to press the students to think more deeply, to master the facts of the case, to formulate issues, to separate important ideas, to reason logically, to proceed from premise to conclusion, and to weigh opposing considerations."

19. "The case leader usually must guide but frequently he must goad."

Your Role as a Questioner

1. "Ask questions whenever there is a need to invite progress in group thinking."

2. "The case leader should not be confined to questions and every comment of a student should not be met by questions."

3. "The case leader should avoid answering directly any student question about the case which can be passed on to another student or the group for an answer or a comment."

4. "The case leader must develop his ability to question individuals in order to get further understanding and clarification."

5. "Bearing down with questions as to facts, calculations or reasoning behind a particular conclusion can achieve desired results without antagonizing either the student himself or other members of the group."

6. "Questions which may be helpful in the case discussion:

a. "To maintain an attitude of suspended judgment: 'Is it as easy as all that? or 'What weight did you give to the fact that...?'"

b. "To define the basic problem and important facts: 'Can we solve this problem before we take up the question of...?' or 'Suppose the facts that you refer to were not the case...?'"

c. "To transfer previous information to the solution of the problem: 'Is there any other way of looking at it?' and 'Why do you suppose that this occurred?'"

d. "To transfer by reviewing past experiences if they relate to the problem: 'Have we seen or experienced anything in the past that presents problems similar to this one?' or 'Was there anything in your (other methods...) prior experiences that may help here?'"

e. "To confront assertions: 'Why?' 'Can we be sure of that without further checking?'"

f. "To stimulate orderliness of an analysis: 'How does your idea bear on the matter that has been discussed?' or 'Let's drop that now and take it up when it is more appropriate,' or 'Let's summarize,' or '...please summarize.'"

Your Use of the Chalkboard

1. "The case leader must use the chalkboard efficiently."

2. "A major part of the case leader's job is to be a recording secretary."

3. "Use the chalkboard as follows:

Left	Center	Right
generalizations supported by analysis	facts problems issues 'mistakes'	recommendations solutions"

4. "The final solution may well be outlined, in some detail, on the chalkboard."

Your Goal in the Case Method

"The case method is fluid, flexible, and progressive. It is somewhat indefinite, as a method, because ultimately the case method is a method of learning which depends upon analysis of real situations and solutions (problem solving), through which students discover applications of concepts and alternatives of judgment to apply to future situations."

SELECTED BIBLIOGRAPHY FOR THE CASE STUDY METHOD

Books

Andrews, Kenneth R. The Case Method of Teaching Human Relations and Administration. Cambridge, Harvard University Press, 1953.

This book is a collection of papers by those who teach and do research in human relations at the Harvard Business School. Some helpful articles include: Some Comments on Teaching by the Case Method, The Case Method, A Classroom Evaluation of the Case Method, Executive Training by the Case Method and the Preparation of Case Material.

Barzun, Jacques. Teacher in America. Boston: Little, Brown, 1945.

The following chapters are quite good regarding student-teacher relationship: Chapter 2 - Pupils into Students; Chapter 3 - Two Minds, One Thought.

Burton, W. H. The Guidance of Learning Activities. New York: Appleton-Century Crofts, 1944.

This text deals with education in a broader sense, however, it should be a part of one's reading in studying the case method.

Buxton, Claude E. College Teaching. New York: Harcourt, Brace, 1956.

This book contains good information on Group-Centered Teaching and Case Analysis.

Elliott, Harrison J. The Process of Group Thinking. New York: Association Press, 1938.

The material in this book is most helpful in suggesting various ways of stimulating student thought.

French, Sidney J. Accent on Teaching. New York: Harper, 1954.

The comments by Hilden Gipson, page 205, contain helpful suggestions for the case method instructor.

Griffths, Daniel E. Human Relations in School Administration. New York: Appleton, Century, 1956.

This text has some interesting articles regarding: Origins of the Case Method, Definition of a Case, Purpose of the Case Method, Teaching by the Case Method, The Major Pitfall, Common Obstacles, and Sources for Case Writing.

Selected Bibliography for the Case Study Method (Cont'd)

Books

McNair, Malcolm P. *The Case Method at Harvard Business School*. New York: McGraw-Hill, 1954.

This text is one of the best for over-all coverage of the case method. The following articles are of extreme value to the instructor: An Introduction to the Use of Cases, Because Wisdom Can't Be Told, What is the Case Method?, Development of a Student under the Case Method, The Values & Limitations of the Case Method, The Role of the Instructor in the Case Method, Use of Case Material in the Classroom, and Preparation to Teach a Case.

Magoun, F. Alexander. *The Teaching of Human Relations by the Case Demonstration Method*. Boston: Beacon Press, 1959.

This is an excellent text for the study of human relations.

Pigors, Paul, and Pigors, Faith. *Case Method in Human Relations.* New York: McGraw-Hill, 1961.

This book is an interim report on some of the observations and experiments made by the authors.

Sheffield, A. D. Creative Discussion: *Methods for Leaders and Members of Discussion Groups*. New York: Association Press, 1933.

This book contains useful information on the case method in the classroom.

Struck, Ferdinand T. *Creative Teaching*. New York: Wiley, 1938.

The material in this text pertains to problem-solving techniques and Dewey's 5 steps in problem solving.

Periodicals

Hunt, Pearson. *The Case Method of Instruction*. Harvard Educational Review 21: 175-192, Summer '51.

The author outlines the functions of the teacher in the discussion process, and he sets forth the difficulties he sees in the method. This article contains valuable information which will help the new case method teacher get started.

CHAPTER 5

The Case Study in Military Teaching

All Air Force schools have a common purpose: to prepare students to solve problems. In some instances, the students may need to acquire dexterity and manual skills. In other instances, the students may need increased knowledge and mental skills. The problems that the students will face when they leave a school must influence the specific mission of that school. Therefore, the school must provide a learning situation that best prepares the student to deal successfully with these problems. The creation of this ideal learning situation in the school environment presents a tremendous challenge to the instructor.

The case study is one method that can often be used to meet this challenge. This method is based upon the premise that the student will probably be able to solve actual problems if he can solve problems of a similar nature in the classroom. Although the case method was first used in teaching law, it is now being used in schools of medicine, business, management, education, and engineering. The case method of instruction is a teaching technique which derives its name from the fact that students learn from study and discussion of real situations presented as written or dramatized cases. Students attempt to solve problems by applying sound principles developed through analytical thinking.

Working both individually and in small groups, students experience many facets of individual behavior and group dynamics. They are exposed to the dissimilar ideas of their contemporaries, and they arrive at a way to transfer new knowledge to specific situations.

Since the purpose of the case method is to develop knowledge into understanding, this method of teaching is most effective when students have a general knowledge in the subject area under consideration.

A case may be presented to students in one of several different ways. The usual way is to present a written narrative which describes an actual situation. This situation provokes in the student a need to determine what is going on, what the situation really is, what the problems really are, and what, if anything, should be done.

Filmed or recorded cases may also be used to add realism by letting the students see the actual setting of the case. Other cases may lend themselves to role playing by the students themselves.

The wide adaptability of the case offers great latitude for using imagination and ingenuity. The case can be used whenever the instructor wants to insure that his students fully understand the application of selected principles. For example, an instructor in a management course might be teaching principles of organization. He may use a lecture or reading assignment to introduce certain principles and to explain fundamentals involved. Now, however, the instructor wants to give the student a chance to apply the principles and to demonstrate his understanding of them. Ideally, students would be placed in a real problem environment to have the opportunity to apply the principles in actuality. This is usually impossible or impractical, so the instructor creates for the student a "case situation" in the classroom. The student is asked to solve a problem by using the understanding he has gained previously in the lecture or his readings. If he can do so, the instructor can feel reasonably assured that the student has acquired the ability to handle real organization problems he may face in the future.

TYPES OF CASE

Any attempt to categorize cases into neat types or groupings leaves something to be desired because of overlapping between types. Cases may be arbitrarily divided into types, keeping in mind that there will be no "pure" example of any of these types. For discussion purposes, then, four types are listed.

The content case, sometimes called the *infor-*

mation case, is designed primarily to impart knowledge to the student in specific subject matter areas. This case might contain a description of an organizational structure, and a student should gain an insight into problems of organization by discussing this structure.

The springboard case, as the name implies, is used to guide students into areas for discussion for which many possible solutions exist. Discussion then emphasizes problem solving rather than final solutions. Discussion may go in many directions as students attempt to analyze and solve problems.

The decision case, occasionally called the *issue case,* is one in which the students are required to reach a decision and then support it. The issue itself may be fairly clear to the student, but learning takes place in the pulling and hauling of ideas which support the decision.

The implementation case is probably the case most familiar to military students. The student reads background material from which a decision has been made. He then is asked to devise a logical plan for carrying out this decision. A variation of the case is the *incident process,* or the *critical incident.* This process emphasizes the analysis of events as the basis for sound decision making. In the incident process, students are given a very brief description of a single occurrence, and through astute interrogation of the case leader, they attempt to establish a framework of facts concerning the incident. In this way problems are isolated, and action, if any, must be determined.

WRITING CASES

There are many commercially produced case books which contain excellent cases in a specific subject matter area. These may be adapted to Air Force requirements and certainly form a ready source for ideas on case form and content. However, since the instructor should know his curriculum and his students well, he may want to consider writing his own cases. The writing of cases is a process which requires great skill on the part of the instructor. Dr. Pearson Hunt of Harvard University states:

> The final text must be on a narrow dividing line. On the one hand it must not state the "real facts," but rather the kind of evidence from which one would have to deduce the real facts in an actual situation. On the other hand, the case must be complete enough, and precise enough to permit learners to think about the problem and thus to learn to think. Whenever possible, each case should present an issue, and the student should identify himself with someone actually facing the problem.

Though it is beyond the scope of this chapter to outline technical steps in case writing, there are certain common threads which are woven into all cases regardless of type or usage. The case writer should consider them as he writes for his program. First, the case should be a description of a real situation. If the case is to result in student involvement, the student must be able to identify with the case. The situation must be one with which he is familiar, either through past experiences or experiences in which he can reasonably expect to be involved in the near future.

The case should be genuinely interesting. The student should feel that by discussing the case he will contribute substantially to his own knowledge. The case must be challenging. The challenge rests upon indications of "school" solutions and easy ways out which do not represent the best in group thought.

The well-written case contains issues on which there can be logical differences of opinion. A case discussion gives little fruitful results if the case leads to a single line of analysis. The case should include reasonable alternatives to be examined and discussed. The problem solving process is at least of equal importance to the final solution in the case method.

ADVANTAGES OF THE CASE METHOD

Perhaps the prime advantage of the case method is that the student is the focus of action in the classroom. The method is, by its very nature, student-centered. A case deals with concrete and specific *real* questions, rather than with abstractions and generalities. The air of realism in the classroom is developed by placing the student in the role of a participant rather than merely an observer. For example, in a case involving an Air Force organizational problem, the student may assume the role of the commander and decide what, if anything, can be done to reorganize the unit or how any group recommendation can be implemented. Thus, cases have built-in motivation for the student.

A second advantage of the case is that it provides experience in contributing to a whole solution for problems. Many students re-echo isolated facts or principles but have difficulty in interrelating these facts and principles. In learning by the case method, students gain experience in making decisions and in working with other people. They are exposed to many different approaches in a problem solving situation. Skills are largely learned by doing, not from assimilating verbally what another has learned. For example, theories and principles are needed for performing certain Air Force specialties, but actual learning of such theories and principles takes place in the organization performing the work where theory and real life meet. The case method allows a student to make errors in the classroom, not on the job where an error would be much more costly. In the case method students learn by participating in a real situation rather than merely being told or reading how a problem could be solved. Outside the classroom students discuss with each other in preparation for class work. Case discussions frequently continue in the barracks or quarters after the class session is over. Self motivation is a prime factor in the case method. This type of motivation clearly expedites learning.

Although the case method is primarily important in developing skills and concepts, it also accommodates acquiring interrelated factual knowledge. He not only accumulates facts but also learns how to use them in solving problems. As a result of a thorough analysis of many cases, a student accumulates factual knowledge, gathering it with perspective and with an awareness of the factual interrelationship. This mastering of facts in relationship to one another is most important. The student develops a critical attitude by using a case. He learns how to select from his general knowledge those facts and theories which are practical. He learns to apply generalizations to particular situations. The case method also trains the student to evaluate possible impact of development. In so doing, it facilitates adjustment to change.

Because the student is involved in a problem-solving classroom environment, he develops skill in communicating his ideas to others. At times the student will build upon what previous speakers have said. At other times he will take exception to what they have said. Both of these actions are techniques of sound communication. Both develop interaction which leads to understanding. Using case studies increases a student's ability to see the point of view of others, to explore and discuss and eventually to reach an agreement.

The case study almost forces the student to think analytically, constructively, and creatively. Using the case generates pressure on the student to think. It gives him a high sense of personal participation. Students contribute to the solution rather than receive it from the instructor. The discussions in and out of class result in critical examination of ideas which helps to clarify thinking.

LIMITATIONS OF THE CASE METHOD

For fact-oriented learning the case method is less efficient than the more teacher-centered methods. If the objective of instruction is the recall of facts or to teach a skill in a particular way, the case could place an artificial barrier between students and the instructor. A lecture probably could be used to cover more material in a shorter period of time.

Clearly related to such limitations is the assumption that the students have a basic knowledge of facts in a subject matter area. The instructor should also be aware that the case is most successful with more mature students. Maturity of the students does not necessarily mean chronological age or even IQ but something more nearly in line with their personality and their readiness to accept certain learning responsibilities.

ROLE OF THE INSTRUCTOR

The instructor can dominate, control, and structure a case discussion, and his solution will emerge. Alternatively, he may demonstrate a high degree of skill in helping students learn through involved participation. If he chooses the latter course, he becomes actually a recorder, a questioner, and a case leader.

As a recorder he gives direction and organization to a discussion. As ideas are submitted in a great number during a free-flowing discussion, the instructor records these on a chalkboard for all students to see. He also records problem areas, facts, assumptions, and items for further analysis and solutions. The instructor must record accurately and objectively. To accomplish this demands disciplined listening and an extremely high level of attention.

When using the case method, the instructor must perfect questioning techniques. Questions clarify personal contributions and establish relationships between contributions. Properly formed questions assure reflective thinking, aid in gathering needed data, and help students follow a problem solving sequence.

Perhaps the most important function of the instructor is as a case leader. The responsibility to assure that the case discussion is a meaningful learning experience is clearly the instructor's. He does not abdicate his role as the teacher. He is a resource person, a reservoir of knowledge about the case and the principles and concepts involved in it. Though he will not advance a "school solution," he should know more about the case than any of his students and should provide accurate information if the discussion is not progressing.

2

He is the helpful expert, not only in the area of subject matter but also in helping students express themselves. He assures that all get a chance to be heard. Since he is the architect of a constantly changing social structure, his expertise must go beyond the bounds of the case itself. It is his responsibility to establish rapport and a mutuality of interest. His point of view on the case remains unknown and does not become the focus of attention.

RESPONSIBILITY OF THE STUDENT

In using the case method, the student must adequately prepare, perhaps more than any other method. If he is not prepared, he is not only doing himself an injustice but also depriving other students of his ideas and contributions. He must, as a minimum, read and study the case as well as corollary readings. If possible, time should be arranged for students to discuss the case in small groups prior to the class discussion.

The student is responsible for thinking reflectively because problem solving is learned most effectively from practice. He should strive to develop a positive feeling for cooperative exploration rather than competitive argument. He further should show fellow students that he has assumed responsibility to communicate with them, to contribute briefly and directly to the discussion, and to help develop concepts from specific items of information.

SUMMARY

The student who becomes involved in learning by the case method "stretches his mind and not merely trains his brain." He learns from dealing with a problem from real life through actively participating and becoming involved.

The case system does not aim to give a student ready-made answers to problems which his military life will present. The purpose of learning by the case method is not to give students answers to questions, not to give them a store of knowledge, nor to acquaint them with best practices. Rather the case method helps students learn how to go about solving real problems, how to develop skills in discovering which problems ought to be solved, and how to realize that in real life action may have to be taken before all the facts can be acquired to decide the right action. Students are provided with materials which make it possible for them to think purposefully. From specific facts, the raw materials out of which decisions are reached, realistic and useful conclusions can be framed.

ERIC Clearinghouse
OCT 25 1968
on Adult Education